The Builder.

VOL. LXXV. No. 2909. NOVEMBER 5, 1898.

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Tank and Cistern Construction.

THE following remarks as to the construction of water tanks and cisterns, and the strains they are subject to, have no reference to any existing structures of this kind, but are intended to convey such general information as will facilitate the designing of a tank or cistern suitable for the position it is to occupy.

No matter what the shape, all the strains in the material of any tank arise from the weight of the water. The weight of a cubic foot may be taken as 62·3 lbs.; and of a cubic inch, ·0361 lbs. It may be useful to mention that a gallon holds 277·274 cubic inches, and its weight is almost exactly 10 lbs., consequently there are 6·23 gallons in a cubic foot. The direction of the stress is always normal to the surface on which the water presses, and its force is proportional to the depth. Thus, at the surface, no stress is applied to the sides, and at a depth of, say, 100 inches, the stress per square inch will be one hundred times the weight of a cubic inch, or 100 × ·0361 = 3·61 lbs.

Owing to the even increase of stress with depth, it follows that the resultant total horizontal pressure acts at one-third the depth above the bottom of the tank; so if a rigid flat plate, such as one made of cast iron, form part of the side of a tank, and be acted on at that level by an equal and opposite pressure, the stress of the water will be met and the stability of the tank assured. If the plate be inclined, a vertical stress will be introduced which will alter the direction of the resultant to a position normal to the plate. It could be easily demonstrated that in a circular tank the stress caused by each horizontal layer of water produces a horizontal strain in the structure of the tank equal to the pressure at that depth multiplied by the radius. Thus at a depth of 100 in. in a tank with a radius of 100 in. the strain at that depth tending to burst the tank would be 3·61 lb. × 100 = 361 lb. If the sides of the circular tank are inclined, then, as before, the direction of the horizontal pressure is altered by the vertical pressure till it is normal to the surface of the sides. These are all the memoranda of a hydrostatical character it is necessary to keep in mind when calculating the stresses on a tank due to the contained water. If the water pressure acts on the outside of an arch or circular tank the crushing stress is calculated in the same way—radius × pressure.

In dealing with water there are important matters to be attended to, such as leakage and the effects of frost. When tanks are large it is useless to attempt to construct them in one piece, except in very rare cases. The consequence is that the greatest care and strict supervision has to be exercised in building them up. As the materials used are mostly brittle the foundations must be perfectly solid. There should be no fear of any portion of the ground sinking, consequently made ground should be avoided; but if that is impossible, it is necessary to make the best of it. It is not that there is any weight worth speaking of to be borne that attention is drawn to the subject, but often there is a sinking of the natural surface when interfered with, and if there is clay it may swell when water gets to it. If there is any suspicion of weakness the best plan is to consolidate the ground by driving in stones with a beater till no more can be forced down, and on this concrete can be placed. A modification on a small scale of M. Dulac's system as applied to the foundations of the Paris Exhibition of 1900 would secure success in any soil. He uses a steam pile-driver with various shaped rams. For light soils they are coned. With this he makes holes, which are filled with hard substances that the rams' further action forces sideways into the earth. The holes are made about 3 ft. apart. Sometimes he uses a mushroom-headed ram, which, however, is not equal to the cone for efficiency.

The next point to be treated is rendering the tank walls watertight. In the case of wrought-iron sides, the joints between the plates are caulked in the same way as ship plates, with cold chisel and hammer. Cast-iron plates should be planed and caulked with rust, the rust being on the side next the water and inserted in a groove left in the castings, as in Fig 1. A is planed and B

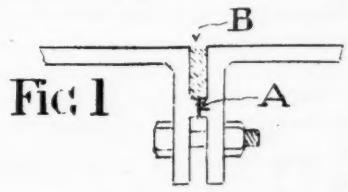


Fig 1

is the rust caulking. To render masonry, brickwork, or concrete sides quite water-tight requires great care; in each case the face next the water should be coated with Portland cement plaster and rendered with neat Portland cement. To avoid cracks there should be no free lime in the cement. To ensure this it should be spread in a layer not more than 3 in. thick on the floor of a shed and kept there for two or three weeks, according as the air is damp or dry. While in the shed it should be turned over three or four times. The plaster should be at least ½ in. thick, composed equally of cement and clean, sharp sand, much depending on the cleanness of the sand. The finishing coat should be ¼ in. thick of neat cement, put on before the plaster is quite dry. Brick or masonry walls should be laid in blue lias grout, plenty of water being used, and the stone and brick soaked before being built in. Instead of the cement plaster the walls may be coated with asphalt, but the above method of plastering has been found efficient. Wooden sides are seldom used except for circular tanks, in which case it forms the cheapest and also a perfectly efficient wall when properly carried out. Of late the staves are run between a pair of rollers, which compress the middle third of their edges, leaving a groove about ½ in. deep; the projecting edges are then planed off to the proper bevel, consequently when the staves are set up close together in place and the water let in, the compressed part swells and renders the joints between the staves quite tight. The staves should be of soft wood, such as Oregon pine or English larch, without knots. English larch will last about as long as oak.

The floor, and joint between it and the walls, requires much attention. It has been stated above that the foundation should be carefully prepared before concrete or anything else is laid on it. Having a good solid foundation, a layer of concrete, 9 in. thick, can be put down and plastered over with cement as described for the walls, to render it water-tight, and this plaster should be made continuous with that on the walls by being carried out at the same time. As in the case of the walls, asphalt can be used instead of the cement plaster; this latter floor might, in the case of a swimming bath, make it available for a roller skating rink in winter. If the walls are plastered and the floor asphalted, the asphalt should be carried up as a skirting 6 in. high on the plastered walls. When the walls are of iron and the bottom concrete, the iron should extend down into the concrete and a space should

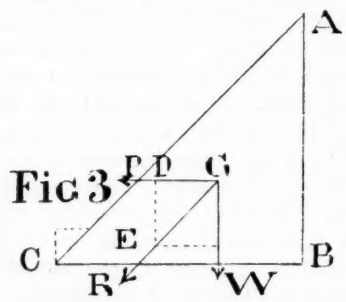
be left between the iron and the concrete, about 3 in. in width, to be filled up with the 1 to 1 cement plaster, the neat cement being carried over it up to the iron. In wooden circular tanks the floor is made of 3 in. planed deal planks tongued and grooved, the groove being $\frac{1}{2}$ in. deep and $\frac{3}{8}$ in. wide and is best cut with a drunken saw. The tongues are of pine 1 in. by $\frac{3}{8}$ in. This floor rests on and is fastened by screws to joists, snfficiently strong not to give when the weight comes on, and its edges are slightly bevelled to fit notches $\frac{3}{4}$ in. deep made in the staves (see fig. 2). It will be seen that

much depends on the accuracy of the workmanship; still, to make sure that the joint between the floor and the wall is watertight, the notch in the stave might be paid over with india-rubber solution. That might also be used in securing the joints at the ends of floor planks when the diameter is greater than the length of available planks. These wooden tanks have one excellent quality, that of keeping out frost.

It is now necessary to describe how the mechanical effect of the stresses above mentioned should be resisted. The walls only need be dealt with, as it is understood that the floor and foundation are secured as above described.

When there is to be a straight or curved wall of brick, masonry, or concrete, without counterforts, it should be made of the strength necessary to act as a retaining wall, to hold up the backing when the tank is empty, as it is then that the greatest stress can come on it. For practical purposes, none of the formulæ for calculating the dimensions are worth much, as there are so many conditions and exceptions to be taken into account. In this respect the pressure of earth is very unlike that of water. It is therefore good policy to adopt dimensions that are known to meet the peculiarities of each case. However, as a general rule, it will be sufficient under most circumstances that the wall have a thickness at top of 14 in., and that the thickness at the bottom is one-third the height, the face battering accordingly. Immediately at the back of the wall there should be punned loose filling, especially if the rest of the filling or ground is clay. If the face of the wall is vertical, then the thickness at the bottom should be half the height. And if the slope of the face be 1 to 1, or flatter, it may have a facing of brickwork 9 in. thick set in Portland cement mortar made of 1 cement to 2 of sand, but the backing must be well punned in layers 9 in. thick. When concrete is used for a wall, to avoid cracks it should be laid in layers not more than 9 in. thick, and one layer should follow the previous one before it has set. It there is any doubt in a particular case whether the dimensions given above are sufficient, counterforts, projecting at the back, of half the thickness of the wall, might be built in at distances apart equal to the height of the wall.

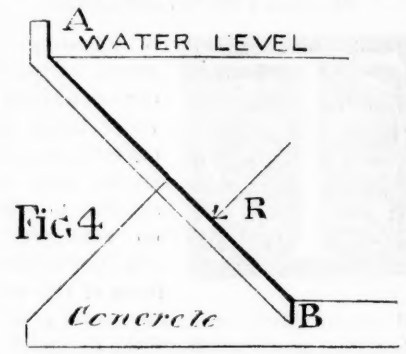
The horizontal pressure outwards of the water being known exactly, and never varying, except in proportion to the depth, the walls may very well be formed of a series of horizontal brick arches without backing, abutting against each other, the abutting points being sustained by walls or buttresses at right angles to the line of arches. These arches for moderate depths may be only one brick (9 in.) thick, and have a rise of 1 in 10; the bricks should be sound, and set in mortar; cement 1 sand 2. If the tank be 8 ft. deep the greatest pressure on the brickwork of the arches is at the bottom, and would be nearly 3·9 tons per square foot, the span being 10 ft. This strain is calculated by multiplying the water pressure by the radius. If the tank is deeper the thickness of the lower portion of the arches should be increased in proportion. The dimensions of the buttresses should be determined in the following manner. It may be assumed when concrete is used that there are no horizontal beds, in fact that they are homogeneous blocks. Their stability depends on their weight, therefore heavy material should be used in preference to light. A cubic foot is assumed to weigh 140 lb. Let A B C (fig. 3) represent the side elevation



of a buttress in which the height A B is 8 ft., and the base B C also 8 ft., G is the centre of gravity of the block, through which its weight, W, acts, and being] one-third the height above the base happens in this case to be also in the line of the resultant horizontal pressure of the water, which is $8 \times 10 = 80$ square feet area, multiplied by $\frac{8 \times 62{\cdot}3}{2} = 249{\cdot}2$ lbs., the average pressure per square foot, making the resultant water pressure P = 19,936 lbs. The forces W and P have a resultant which, according to well-recognised practice, must pass through the middle third of the base to prevent the toe at C from crushing. Keeping to this rule, we can find the least proper thickness of the buttress by drawing G R, to represent the line of the resultant, just through the middle third of B C, and as far from the face, A B, as possible. If a parallelogram of forces be now constructed by laying off from G on G P the horizontal pressure, and from the point, D, so found drawing a line parallel to G W till it cuts the line of the resultant at E, the line D E will represent the weight of buttress necessary to sustain the water, and which happens, in this case, to be just the same as the resultant pressure of the water, viz., 19,936 lbs. As the area of the face of the buttress is 32 square feet, and the weight of a cubic foot 140 lbs., the thickness must be $\frac{19{,}936}{32 \times 140} = 4{\cdot}45$ ft., say, 4 ft. 6 in. It will be noticed that there is a dotted addition to the buttress at C; this is necessary to keep the concrete, where it is thin, from crushing.

This form of wall is suitable when the bottom of the tank is at or near the surface of the ground, and it enables a platform to be made round the tank cheaply when it is used as a swimming-bath.

In small tanks with straight sides composed of cast-iron plates the thrust of the water is often taken by tie-rods holding opposite sides together. In large tanks the variations in length of the ties joining opposite sides caused by changes of temperature prejudice the safety of the tank so much that the side plates are tied to the bottom plates by inclined rods if the bottom is composed of cast iron; if not, they must be supported by struts outside the tank. In that case it is best to incline the plates outwards, so that the line of the resultant thrust will pass into the ground at a short distance from the bottom of the plate. Thus (see fig. 4), let there be a series of plates A B,



well stiffened with gussets, bolted together, and inclined to the vertical at 45 deg.; the resultant pressure of the water R will act normal to the surface of the plate at one-third the depth from the bottom as shown in the sketch, where it is also shown to be resisted by a mass of well-rammed concrete backing under the lower half of the plate. This is a safe form of structure, and in some localities may be the cheapest. Wrought iron or mild steel plates may also be used of proper form, but a great deal of riveting work would have to be done on the site by skilled mechanics, whereas the bolting of the cast-iron plates together can be done by any intelligent labourer.

Wood is not suitable for constructing straight sides of tanks unless leakage to some extent is permissible.

When tanks are of circular form, many difficulties as regards their sides are got rid of, as the water pressure produces only tensile strains of known force. They having been provided for, and leakage prevented, as above described, a satisfactory tank can be made. For instance, the sides of a tank 8 ft. 4 in. or 100 in. deep, and of the same radius, would have to resist a maximum strain of 361 lbs. of the lowest layer of water 1 in. thick, and as mild steel will carry safely 6 tons or 13,440 lbs. per square inch, a plate ·027 in. thick would theoretically be sufficient, but it would not be practical to have so thin a plate. For a tank of the above diameter $\frac{1}{4}$ in. thick plate can be used throughout when it is as much as 70 ft. or 75 ft. deep, or the tank may be same depth as before and 70 ft. to 75 ft. radius, say 150 ft. diameter. It is hardly worth while using a thinner plate than $\frac{1}{4}$ in. which can be properly caulked. There should be as few vertical joints as possible, so the plates should be as long as obtainable. The horizontal joints may be lapped, but the vertical joints should have a cover plate on

both sides. If the plates are narrow, say 1 ft. effective, hydraulic riveting can be adopted, which is much superior to and cheaper than hand work. The top and bottom should be stiffened by angle iron rims.

When cast-iron plates are used the whole tensile strain comes on the bolts and on the plates as well, and as this material is very inferior to mild steel in resisting tension it should not be used for large circular tanks; further, it is stiff and rigid, and will not give like wrought iron or steel, should there have been any small error in setting out the circle.

The staves of wooden circular tank walls have no cohesion to each other. That has to be supplied by hooping them round with iron or steel rods, wire, or bars, the strength to be given to these being found, as before, by multiplying the pressure of the water against the side by the radius. Rods of mild steel are generally used. Before being fixed they should be bent to a slightly smaller circle than the tank, and it does not answer to make them too long, as then there is difficulty in getting them to squeeze evenly against the wood. The ends of these rods are swelled and screwed, passed through a casting, and tightened up with nuts; but there is no reason why an upright T iron should not have its head sunk into the wood, the bars going right and left through the web and tightened with nuts, as in the previous case; or it might be a channel iron, the bars going to the left through one web, and to the right through the other. If such a circular wooden tank be 50 ft. diameter and 25 ft. deep, the strain on the sides at the bottom works out as 3,249 lbs. per square inch, and, taking a steel rod as carrying safely 13,440 lbs. per square inch, rods one inch diameter would have to be placed near the bottom, $3\frac{1}{4}$ in. apart, as hoops, to sustain the pressure, and, proportionally as the pressure decreases, wider apart higher up. Wooden tanks may be lapped with wire instead of hoops made of rods, with advantage.

In the Monier system of construction, wire or rods are used embedded in concrete, the former placed so as to take the tensile strains, the latter the compression strains, and in the case of the sides of circular tanks simply to keep the water in. They require great care in construction, and should only be adopted when specially skilled workmen are available. It may here be added that straight concrete walls with iron rods embedded in them, and properly placed in accordance with the rules of this system, might be used instead of the horizontal brick arches mentioned above for the sides of tanks.

It now only remains to mention that when tanks are supported on high towers any attempt to make them appear what they are not is neither good taste nor necessary, for a tower designed to show the lines of force will in general have the best effect in the situation. The essential points to be attended to in the design are that the top should be of greater diameter than the shaft of the tower, and that there should not be any batter in the latter. The reasons for these rules are (1) that bulk is required to hold the large quantity of water that warrants the trouble and expense of building the tower, and (2) owing to the great weight carried aloft batter is not required to enable the tower to withstand the horizontal pressure of the wind. The water towers at the Crystal Palace and those erected in various towns in Holland, are good examples showing the effect of carrying out the above rules. All tanks in such a position should be circular, and the bottom should be supported in such a way that the weight of the water inside the supporting ring should equal that outside of it. Thus, if the tank be 30 ft. diameter, that of the tower should be 21 ft., which will give an over-hang of 4 ft. 6 in. all round. Tanks so exposed, if made of iron, should be lagged to prevent the water freezing, and a series of louvres on the outside would keep the direct rays of the sun from raising the temperature of the water.

NOTES.

London Water Supply.

We very much doubt whether the London County Council will get any immediate practical result from the passing of the resolution to provide a Bill in the next Session of Parliament for the purchase, by agreement or compulsion, of the undertakings of the eight metropolitan water companies. It is certain that nothing of the kind will receive Parliamentary sanction until the Report of the Royal Commission has been made and fully considered; and even if the Report is presented during the Session, as we certainly think it ought to be, it will not be a document to be considered in a hurry. At the same time we do not think the Council are to be blamed for passing the resolution. There has been so much delay and procrastination in connexion with this very serious subject, that it is as well that any movement towards bringing it to a head, in one way or another, should not be postponed; and the attempt of the County Council to bring in a Bill with no further delay is likely at least to have some effect in accelerating matters. That the London County Council is the proper authority to deal with the water supply of London can hardly be questioned; so long as it is true to its duties and does not allow mere political considerations to interfere with them. That the municipality of a city should undertake its water supply is now becoming more and more an accepted principle in the case of the large provincial towns, and the London County Council is in the position of being the municipal governing body of greater London. That a necessary of life should continue to be supplied to the most crowded area in England by private companies, who naturally place the interests of their shareholders before those of the public, and whose aim is to supply no more water than they are obliged to supply, is a state of things which can no longer be supported. The most noteworthy sentence in Mr. Dickinson's able speech in support of the Report of the Water Committee was that in which he referred to the possible condition of the lower Thames in thirty or forty years, if the abstraction of water went on at an increased rate, when it would become only "a pond, oscillating backwards and forwards silt and filth, instead of the river that ought to run down to the sea." And that would mean in the end the destruction of the port of London.

M. Corroyer on Mediæval Architecture.

Our contemporary *L'Architecture*, the journal of the "Société Centrale des Architectes Français," publishes in last Saturday's issue a paper read by M. Corroyer at the annual meeting of the French Academy on October 25, the subject being "The Origins of Mediæval French Architecture." We have on previous occasions taken exception to some of M. Corroyer's theories, especially those dealing with the origin of the pointed ribbed vault. The members of the five Academies must have been somewhat startled by some of the statements made on October 25. Among these we find one which informed them that St. Mark's at Venice was built after the Roman manner, the masonry cleverly put together, moulded so to say, and afterwards covered with a brilliant decoration, composed of stucco (*de stucs*) and mosaic. We should have thought that even a French Academician might be acquainted with the fact that the core of St. Mark's is built entirely in brick, and that it was afterwards decorated with marble panelling and marble columns brought from the East. M. Corroyer, by way of contrast, then states that St. Front at Perigueux was built in ashlar masonry of striking beauty in its majestic simplicity. The stucco, apparently, therefore was brought in to discredit St. Mark's in comparison with St. Front, and he may have appealed to the vanity of his audience if not to their learning. Again, M. Corroyer states in a note that the three pendentives of St. Front built with horizontal courses were reconstructed during the last century, without reference to their original bedding in courses normal to the curve of the pendentive. This is in distinct contradiction to the statement made by M. Lambert, the resident architect on the work, to Mr. Spiers, and quoted by him in his paper read to the Institute in February, 1896. (Page 254, Royal Institute of British Architects' *Journal*, 95-96.) The upper stones of the pendentives with horizontal beds are carried four feet deep into the pendentive, and could not be removed without bringing down the superincumbent dome. Again, speaking of the Syrian churches of the sixth and seventh centuries M. Corroyer says they are covered with barrel vaults, surmounted at the crossing with domes imitated from the Persians. Bnt the two earliest barrel vaulted churches of Syria were those built by French masons at Byblos and Tortosa about 1130, in imitation of work long existing at Carcassonne and other churches of Provence, and the earliest instance of a dome at the crossing is in the church of St. Anne, in Jerusalem (1151), also built by the French, and now belonging to the French nation. The domes in question are all built in imitation of the domes of Perigord and Angoumois, and certainly by French masons. M. Corroyer here seems to have lost his opportunity of appealing to the patriotism of his audience. These are only three of the many errors which serve to characterise M. Corroyer's address.

Mr. Preece's Address.

Mr. Preece's Presidential address to the Institution of Civil Engineers dwelt on the enormous strides which have been made in the use of electricity. His remarks on telephony were listened to with special interest in view of the recent report of the Select Committee. As electrician to the Post Office, Mr. Preece naturally regards telephony as an Imperial business, and considers that it ought to be in the hands of the State. Those who can appreciate the problems that the Post Office had to solve when it first took up long distance telephony, and the able manner in which the difficulties

were overcome, will agree with him in thinking that there would be no great risk in placing the management of ordinary telephony in their hands. At the present moment it is theoretically possible to speak to every capital in Europe, and although the cost is all but prohibitive, it may very soon be reduced when the proposed telephone cables have been laid between this country and Belgium, Holland, and Germany. Mr. Preece also touched on lightning conductors, in which he considered that very little real progress had been made since Franklin's time. This, however, is only partly true, for although there is not much difference between the modern method of using lightning conductors and Franklin's method, yet the great advances in the theory of electricity in recent years have enabled us to understand exactly how they act, and so enable us to keep them efficient. Mr. Preece also touched on the possible applications of wireless telegraphy to lightships, and pointed out that as this system was independent of day or night, fog, rain, or snow, it could be advantageously used, flashing its signals by electromagnetic disturbances into space, and thus, when ships were provided with receiving apparatus, giving them exact information of their position.

Compulsion and Sanitary Work.

A somewhat curious case was decided last week by Mr. Justice Channell and a jury. The Sanitary Inspector of the Walthamstow District Council had served a notice on the occupier of certain premises to abate a nuisance arising from defective drains and to do certain work upon them. As a matter of fact the drains in question were legally a sewer, and therefore it was the duty of the Sanitary Authority to do the work. It was done, however, by the owner of the premises and her agent, a builder, who sued the District Council for the expenses. These it was decided they were entitled to recover, as the plaintiffs had acted under compulsion from the defendants, and not voluntarily. The Judge stated that the fact that the plaintiffs would have had a good defence to any summons before a magistrate did not lessen the actual compulsion arising from the notice. We confess that when there is no legal duty on a person to do a certain act which he is requested to do, the "compulsion" must be considered very slight. It is pretty obvious, however, that as the District Council ought to have done this work themselves, both Judge and jury would not be inclined to let them off paying for it, even if the person who actually did the work was under no legal duty in respect of it.

Wolverhampton Workhouse Competition.

According to the report in the Wolverhampton *Express and Star* of the 28th ult., the Wolverhampton Board of Guardians last week had a long discussion as to whether they should or should not accept the assessor's award in the Workhouse competition. The assessor, Mr. Aldwinckle, had decided in favour of the plans marked "North and South," by Mr. A. Marshall. Three votes were taken in succession for the substitution of three other designs, all ostensibly on grounds of economy, but in two instances it was pretty manifest that the real object was to get in a local architect. None of these attempts however met with much support, and the assessor's choice was ultimately accepted by a large majority of votes. The most regrettable feature of the case was a letter written to the Board by Messrs. Mangnall and Littlewood and Mr. Johnson, of Manchester, joint authors of one of the designs, in which, after stating their belief that the estimates for the selected design were too low, they concluded as follows:—

"We are so convinced of what we now state that we will undertake to furnish bona-fide builders' estimates at our own cost, and take out the quantities, if the Guardians will do the same for plans 'North and South,' and if the estimates for our drawings do not come to 20,000*l.* less than 'North and South' we will make no charge for quantities, conditionally that the Guardians are then satisfied, and give us the work to carry out.

We should think this a proposal worth considering, and hope to hear from them"

That is a kind of letter which no competing architect ought to write, and to which, if written, no Committee ought to pay the slightest attention. In this case the Board put the writers of this letter up to be voted for, though, as already observed, the vote was not carried. One member of the firm whose signature appeared to the letter is, we regret to say, a Fellow of the Institute of Architects.

A Railway "Accident."

It is reported that early last Saturday morning two goods wagons were derailed near Peterborough station, while being shunted, blocking up the main line. The signals were off for a mail train, but the shunters gave an alarm, the signals were immediately reversed, men were sent along the line with red lamps, and the train was fortunately pulled up. The commendable promptitude which thus averted a terrible disaster, would apparently have been unavailing had the passenger train been a minute or so earlier, and the good fortune of the Great Northern Railway only serves to further point the moral of the Great Central Railway catastrophe of a week or two earlier. The latter occurrence was designated an "accident," while that at Peterborough is called "a narrow escape." But, to our mind, the safety of the Great Northern express may fairly be regarded as largely due to an accident—a fortunate one; and while congratulating the passengers and the company upon their escape, we repeat that the incident justifies our remarks of a fortnight ago on the practice of shunting alongside the main line when passenger trains are due.

Golders Hill, Hampstead.

We learn, as mentioned in a paragraph under the heading "Open Spaces," on another page, that subscriptions by Vestries and other bodies towards the purchase of the late Sir Spencer Wells's house and its beautiful grounds are going on very well, and that it is proposed that the London County Council should adapt the house for a natural history and botanical museum in connexion with their technical education work, and retain the garden as a botanical garden for students and for the general public. If this is done, and if the gardens are kept as they ought to be, the public will have a new and charming pleasure ground, including a sloping lawn amid fine trees and commanding a most beautiful view to the westward. One cannot help regretting that a house which has so many associations with eminent names should cease to be a private home; but it is at least satisfactory to think that the place is not to be laid waste for roads and building plots.

Cowper's Homes in Buckinghamshire.

In the sale of the Weston Underwood Estate is included the house occupied by Cowper during nine years. In 1767 he and Mrs. Unwin removed from Huntingdon to Olney where, at "Orchard Side," a home was found for them by John Newton, then curate-in-charge of Olney. The house, of red brick with stone dressings, stands in the market-place, and the summer-house has been preserved. In February, 1896, were offered for sale the garden, which forms the subject of the third book of "The Task," and the adjoining "Guinea Orchard"; these were bought, we believe, by the then tenant, who had converted the orchard into a lay-stall. The orchard had its name from the payment of one guinea per annum for a right of way between the vicarage and the garden. In 1786 Cowper quitted Olney, and went to reside at "The Lodge," in the village-street of Weston, less than two miles distant. Walking from Olney to Weston one can readily recognise many of the places described in "The Task," written in 1783-4; such as, for instance, the "peasants' nest," the "rustic bridge," the "wilderness," and the "grove," with the barn wherein the thresher plied his constant flail; the poplars whose fall he laments stood by the Lavendon Mills near the long bridge across the Ouse. The road passes by the estate, of about 1,000 acres, that belonged to the Throckmortons—the "Benevolus" of the poem was John Courtney Throckmorton. The manor-house was pulled down *circa* 1825, we believe; its Roman Catholic chapel was replaced with one built at the end of the old stables, and Cowper's sundial was set up in the officiating priest's garden.

Society of British Artists.

It is to be feared that very little can be said in a general way of the Society's exhibition; but it contains one work of some interest—a small edition, in a decorative frame, of Mr. Holman Hunt's "May Morning on Magdalen Tower" (7), which is in fact more acceptable than the large one, as the hardness of execution is less prominent, or at all events less injurious, on this small scale, and the various studies of character in the heads render it a work impossible to pass over. Mr. Machell's "The Cup," a painting of considerable pathos and arranged effectively in a symbolically designed carved frame, which seems to have been rather inspired by Blake, is an original work which would lead us to expect more from the artist. Among pictures which are above the general level are Mr. Leonard Watts's "Across the Sands" (50), slack in execution but good in conception; Mr. Sanderson Wells's little work, "Minding Sheep" (57), Mr. C. H. Eastlake's "impressionist" landscape, "Autumn's Gold" (91); and Mr. Walter Fowler's "The Gravel Quarry" (174), a much better landscape than most in the room. Among the water-colours Mr. Kinsley's "Old Sandpit, Surrey" (210) and Mr. Lee Hankey's "A Grey Day" (246) are worth special notice. The vestibule contains a collection of drawings of architectural subjects by Mr. Hamilton Jackson, which are of some interest; and a screen in one of the small rooms is occupied by a large finished drawing and various sketches, all of architectural subjects, by the President, Sir Wyke Bayliss.

The sketches are excellent; they show this artist's powers as an architectural artist to much better advantage than his more elaborated works, and we are glad to be able to admire them unreservedly.

The President of the New Salon.

M. Carolus Duran has been elected President of the "Société Nationale des Beaux-Arts" of Paris, otherwise known as the "New Salon." The new President, whose real name is Charles Auguste Emile Durand, was born at Lille in 1837. In 1890 he was one of the most ardent partisans in the difference which sprang up in the "Société des Artistes Français," from which resulted the establishment of the rival Salon. M. Carolus Duran, as he has been long called, received medals in the annual exhibitions of 1866, 1869, and 1870, and in the international exhibition of 1878; was created "Officier" of the Legion of Honour in the same year; received the "médaille d'honneur" of the Salon in 1879, and became "Commandeur" in the Legion of Honour in 1889. Though best known as a portrait-painter, he has paid some attention also to sculpture, and exhibited two bronze busts. His position in the New Salon it is not very easy to understand, inasmuch as his artistic methods and school are certainly those which are more generally represented in the Old Salon. After his election as President, the following other officers were elected: President of the section of Painting, M. Roll; of the section of Sculpture, M. Rodin; of Engraving, M. Waltner; of Decorative Art, M. Cazin. MM. Jean Béraud and Billotte are elected Secretaries, and M. Guillaume Dubufe Treasurer. Architecture seems to be omitted; and in fact it has never played any but a very insignificant part in the New Salon exhibition.

A Religious Guild for Architects.

We have received the following letter from a lady, who is for special reasons interested in architects and architecture:—

Dear Sir,—There is a Guild of St. Luke for the Physicians and a Guild of St. Matthew, but I have long wished to hear of a St. Simon and St. Jude's Guild for Architects. The Collect, with its reference to the "Head Corner Stone," and ourselves being 'made an Holy Temple," is so singularly appropriate, that one hopes such a Guild of unity for the service of God and the good of men may be formed.

You or your readers will know best how this might be inaugurated. Architectura.

St. Simon and St. Jude's day, 1898.

St. Simon and St. Jude are, we believe, traditionally considered as the patron saints of architects, though on what ground we know not: that however is a minor matter. We fear that we cannot offer any suggestions as to the formation of such a Guild, and that the idea itself will be regarded by many—perhaps most—readers as out of date, or appealing only to a minority of specially orthodox Churchmen. Still, we willingly publish the letter for those who may be interested in it, and may add that with the feeling which prompted it, at all events, we are entirely in sympathy. A union with the object of connecting the practice of one's profession with the "Service of God," in the true sense of the words, could hardly have any but a good effect on those who entered into it. Only people may have different views as to the true import of those words, and some undoubtedly will regard the adoption of the name of a patron saint as an anachronism in these days.

THE NEW ARCHITECT:

HIS WORK AND REGISTRATION.*

In one of Thomas Hardy's earlier novels there is a description of a young architectural draughtsman engaged in measuring and sketching what is termed "a chevroned doorway, a bold and quaint example of a Transitional style of architecture, which formed the tower entrance to an English village church," and, as subsequently appears, was surmounted by "a battlemented parapet fired to a great brightness by the solar rays." The author goes on to describe the professional evolution of this youth, how "when quite a lad, in the days of the French Gothic mania which immediately succeeded to the great English Pointed revival under Britton, Pugin, Rickman, Scott, and other Mediævalists, he had crept away from the fashion to admire what was good in Palladian and Renaissance"; how "as soon as Jacobean Queen Anne and kindred accretions of decayed styles began to be popular, he purchased such old-world works as Revett and Stuart, Chambers, and the rest, and worked diligently at the Five Orders"; how he got tired of the whole thing and took refuge in verse, till his father, the painter-Academician, threatened to cut short his allowance, and he "awoke to realities, became intensely practical, rushed back to his dusty drawing-boards, and worked up the styles anew with a view of regularly starting in practice on the first day of the following January."

We may pass leniently over the Transitional chevroned doorway, the battlemented parapets, and the like, and content ourselves with noting the author's ideas, probably shared by most of the public, as to how architects are made, or rather are not made, after the manner of poets and Swiss admirals. Unsophisticated as such notions may now strike us, they would have been nearer the mark in the days of Ictinus or William of Wykeham, when steel skeletons, sanitary plumbing, hydraulic and electric lifts, forced ventilation, steam heating, cooking, and washing, and electric lighting, the bones, arteries, and nerves of our buildings, had not to be cunningly interwoven with the features of inventive art into an organism almost as complex as the human body; when planning arrangements were as simple as it is possible to conceive; when the commercial and the domestic did not vie with the monumental; when material, labour, and room were secondary considerations; and the great problem of how to make a yard of land and superstructure yield the highest return had not given us the Chicago sky-scraper.

The man who successfully calls a great modern building into existence is as different from the architect of old as the New Woman from the housewife with whose appreciation Solomon closed his Book of Proverbs; the planning alone of Portraine Lunatic Asylum would probably have driven Vitruvius into the Richmond. The New Woman! why not the New Architect? So long ago as 1568 Philibert de l'Orme heralded his advent, and drew him, to the never-tiring delight of William Burges, with as many organs of sense as one of the Four Beasts of the Apocalypse.

Before, however, we talk of the new architect—this great beast, as it were, of the century's revelation—we must be sure that we know what he is. Mr. Hardy (as we have seen) with the generality of his readers (as we may conclude) does not seem to know; we may think we know ourselves, but when we find, as we presently shall, that even Mr. Norman Shaw does not seem to know, we begin to rub our eyes and wonder if, after all, we are nearly through the twentieth century, and that Ictinus, Vitruvius, William of Wykeham, and Sir Thomas Tresham are really dead and buried. There is no use in looking in the dictionary, or attempting to differentiate the fine art of architecture and to argue from the thing made to the maker. We want no *à priori* definitions. The thing made, New Scotland Yard, the Hotel Cecil, Portraine Asylum, or the late President's latest bungalow, stares us in the face, and the architect is the man who is paid 5 per cent. (by the owner) on the total cost (exclusive of furniture) for drawings, specification, and superintendence. I say "exclusive of furniture," as I am dealing with the typical cases only.

I do not suppose that any architect, even a Royal Academician, would gainsay that definition, and yet in the silly controversy that took place in the *Times* and elsewhere in '91 as to whether architecture was a profession or an art, it was only too plain that a *côterie* of so-called artist-architects existed gifted with qualities too ethereal for the hall-marks of the architect's and engineer's bill, and perched on too high a plane to be conscious of steel, steam, or electricity, save, of course, in respect of 5 per cent.

In a letter to the *Times* of November 11, 1891, Mr. Norman Shaw calmly contended (1) that an architect was a man whose qualifications could not be brought to the test of examination, and that (2) an architect was not such in respect of the scientific construction, &c., in which he should doubtless be proficient, but in respect of certain undefined artistic qualities, which, in his opinion, made a man an architect. The correspondence which followed in the *Times* and the *Builder* only showed how much can be written about words rather than ideas, and the necessity, as even Mr. T. G. Jackson, another Academician, finally admitted, of having some fixed relation between the two.

The controversy arose in a memorial presented to the Council of the Royal Institute of British Architects, signed by seventy architects and others, including fifteen members of the Royal Academy, and in a letter which the memorialists published in the *Times* of March 3, 1891, under the title of "Architecture a Profession or an Art." The very title assumes that the terms exclude one another. As a matter of fact, there are probably no two words in the language more loosely used and more calculated in such association to promote logomachy. We are not concerned, however, with the meanings of the terms "profession" and "art" except to ascertain the senses in which the memorialists used them, and it is clear from the memorial and Mr. Norman Shaw's letter that, in so far as their contention was concerned, they regarded the former as a calling which possessed amongst other characteristics a coarse capability of being tested by examination, and the latter as one altogether too spiritual for appraisement.

Before men attempt to pull the mote from their brother's eye they should cast the beam from their own. How can those who are themselves branded with the coveted hall-mark "R.A." declaim against the iniquity of a diploma in architecture or any other art? who hold yearly examinations for their own studentships and prizes; who every spring sit on the hanging committee at the great competitive examination in Piccadilly, and not only award the palm of place but temper their appreciation with the finer distinctions of "line" and "sky"?

Mr. Norman Shaw complains that a professional diploma admits of no nice distinctions; that it merely marks a minimum. Do the hall-marks A.R.A., and R.A., the bachelor's and doctor's degrees in the art world, admit of these nice distinctions? Do they reveal any gap between Mr. Norman Shaw and Mr. Aitchison? Then people forget that if art cannot be weighed in the balances taste sinks to preference, criticism to dialectics, and the *Grand Prix de Rome* to an empty honour. The whole position is so absurd that had it not been assumed one could scarcely realise its assumption.

The point has a double interest for us, however (1), in respect of our notion of the new architect, and (2), in respect of his capability for the registration which every day becomes more of a necessity. It would be quite possible for a paternal government to protect the public from bad art by passing bills for the registration of poets, musicians, painters and sculptors, as well as of architects, and I'm not at all sure that we would not be the better of it. Think of the doggerel rhymes, the Ta-ra-ra-boom-de-ay jingles, which have shortened our too short lives; the pots of paint which have been flung in our faces; the plastic abortions that haunt our gardens in life and our graves in death; the whittling that masquerades as wood-carving. Are these things that filch the flavour of life a whit less harmful than the Chicago sky-scraper, the jerry-built tenement, the building that collapsed the other day at Westminster, or the public-house in Wine-tavern-street, which a local wag palmed off on Mr. Street as a posthumous work of the late Sir Thomas Deane? There is nothing in the nature of things which would go to make such spoon-feeding in art impossible; but we do not press for it. These monstrosities may not swell our asylums, but the architect may fill the

* Inaugural address to the Architectural Association of Ireland, delivered by the President, Mr. Howard Pentland, R.H.A., on October 25.

surgical as well as the fever ward, the graveyard as well as the Union; and with a free hand.

No amount of "high-falutin" (there is no other name for this contemptible nonsense) will get over the fact that artists of every kind can be and are measured and appraised just like any other people. We may put up with the moral injury of bad design, though I do not see why we should; but let us at least insure that it is accompanied by no injury to life or limb. "We think that no legislation can protect the public against bad design, nor could legislation help to prevent bad construction unless builders and all others who erect buildings were required to pass the test of examination as well as architects, inasmuch as architects are not employed in the majority of cases." So say these memorialists. Was ever a contention so apparently disingenuous? Because complete protection seems out of the question we are to have none! They forget that bad design includes bad construction, and that in the absence of legislation everybody who designs a building is the architect of that building, just as bad doctoring includes bad prescribing, and that in the absence of legislation every cheap jack who peddles pills at a fair may undertake a case. Imagine any sane man writing "we think that no legislation can protect the public against bad doctoring; nor could legislation help to prevent ignorant prescriptions, unless druggists and all others who give medical advice were required to pass the test of examination as well as doctors, inasmuch as doctors are not employed in the majority of cases"! I suppose people did think so in the days of the barber-surgeons, but they do not now.

And what is the result of this architectural free trade—and I include engineering, because it would tax the combined genius of the Royal Academy and the Institution of Civil Engineers to say when one begins and the other ends? That the medical architect and the medical engineer have arisen; men who in the intervals of their legitimate work are given to crossing the border and cunningly investing the work of others with the cloak of medical speech. They pose at congresses; they write books on domestic plumbing and municipal sewerage; they advise and take fees, and endeavour to oust the architect or the engineer *whose business this is* (don't forget that Mr. Norman Shaw designed a famous soil-pipe disconnection), and they are countenanced in their unprofessional invasion not only by a one-sided legislation which prevents their being paid back in their own coin, but by a clique of disloyal architects who seem quite unable to realise that what they regard as design *par excellence* should be bound up as indissolubly with the organism of which it is the manifestation as the human face and form.

I am glad to feel that these therapeutic poachers are not representative, and that their less hungry brethren would be as ready as I to condemn *any* methods where mutual issues are concerned but those of honest co-operation.

I have no more to say in respect of the *first* contention, that an architect is a man whose qualification should not be brought to the test of examination, and will pass on to the *second*—viz., that an architect is not such in respect of the scientific construction, &c. in which he should doubtless be proficient, but in respect of certain (undefined) artistic qualities which make him an architect.

The position, as I have already indicated, results from an inadequate idea of what architecture is, of the utter inseparability of what is termed scientific construction from the laying of one stone upon another. The artistic and scientific are aspects rather than factors of an architectural work. Man is so constituted that he cannot as much as split a sleeper from a log without some endeavour to make it sightly, and even the knowledge that there are such things as beds in quarries and grain in timber that a chisel will cut and a hammer will drive, is sufficient to give rise to scientific construction. It seems to me an insult to intelligence to have to point out that you cannot have architecture unless you construct, nor construction without science. The science involved in placing a stone in the best way in a wall or in selecting the straightest grain, differs only in degree from that involved in vaulting Salisbury Cathedral, roofing Westminster Hall, or spanning the Tay and the Forth.

A man *must* construct scientifically; and unless he is worse than a savage he *must* construct in a pleasing manner. This is the whole contest of architecture. If the construction be not the best that could have been adopted from every point of view without increased expenditure, the design is in so far defective. Construction may fail to please in other respects than that of mere formal beauty; it may not tell its tale as well as it might; it may even tell a false tale and degenerate to a mere veil to conceal what the architect lacks—the genius either to present *in puris naturalibus* or to clothe with a lifelike skin.

The Augustan architect lacked both genius and the courage to present to a people who borrowed both literature and religion from the other side of the Adriatic, the Romanesque that lay beneath his varnish of Greek detail. The architect of Francis I., who designed the Church of St. Eustache, at Paris, deliberately smeared what might have been a very decent Gothic church with a very similar coat of Italian detail, and a century or so later we find the English Palladians side by side with the useful and modest Queen Anne and Georgian designing the elevation first, and then making the interior fit it instead of the other way about. How few people ever realise that even Wren, whose Italian work was tempered with French leanings, had not the courage to classicise the flying buttresses with which he was obliged to stay his nave vaulting, but built a sham second story, a mere screen wall, to hide it. Everything that leaves the hand of a designer, from a cathedral to a pitcher, should bear the honest stamp of its origin and use. There is, perhaps, no more hopeless confession, nothing more calculated to raise the ghost of Palissy, than that bathos of the potter's art, the straw hat that cools your butter, or the hen that hatches your boiled eggs.

There are doubtless some styles in which this characteristic of the best art of the best times has not been so prominent as in others; styles which in the hands of Boule, Caffieri, and Martin, or of the more temperate Chippendale, Hepplewhite, and Sheraton, grew in exaggeration and extravagance from Louis Quatorze to the Regency, or graced the scenes with which Hogarth has made us familiar. The *bombé* commodes and tortured bureaux inlaid with tortoise-shell and nacre, decked with meretricious marquetry and Vernis-Martin, glaring with twisted and intrusive brass and gilded with ormolu, which characterise French design of this time, fairly beat down the guard of criticism, and almost persuade us, against our better judgment, that genius may condone or refinement atone for the worst license.

These *jeux d'esprit* are, however, more apparent than real exceptions to the general principle which, on reflection, all designers will endorse, viz., that in architecture (which in its most general aspect may be defined as the material expression of a human need beautifully satisfied) the artistic qualities which, according to Mr. Norman Shaw, make a man an architect, and the scientific construction in respect of which he is not an architect, are the warp and the woof of a fabric to whose existence both are indispensable. The artist-architect affects to disparage what he regards as the independent art of scientific construction, just as some engineers affect to disparage what they regard as a mere varnish of architectural detail; but if two factors are indispensable to a product, it is idle to disparage either in name of the other. I am afraid that the idea of the Augustan architect that his craft consisted in flinging a mantle of independent architectural forms around bald engineering rules both ends, and I do not know which is the greater fool: the man who looks down on construction from the pinnacle of his art, or the man who looks down on art from the pinnacle of his construction; the warp that despises the woof, or the woof that despises the warp! A crown of laurels may grace a human head, or a series of swags a marble frieze; but the beauty that is not applied is of a different order, and does not come at everybody's bidding.

If, as we have seen, it is impossible to eliminate either science or art from architectural design, the barrier between architecture and constructive engineering breaks down, and the thing is called by one name or the other, according as art or science predominates. The line between them is a *mere convention*, and as we all know, it is very hard to draw it. It matters little which term we use, but as architects existed before engineers, or, in other words, took all as grist that came to their mill, before (owing to the advance of science) it became impossible for a man to excel, like Michelangelo, at both poles of his profession, I intend for the present to use the word architecture in its broader sense, to regard it as the material expression of a want more or less beautifully satisfied as judgment or funds dictate. This is a very important point, and the following considerations will drive it home:—An art is the application of knowledge or science to some practical end. A fine art is its application to some product calculated to cause pleasure by means of a few of the more important or integrating senses, and the product may be either a representation or an invention. Such are poetry, music, painting, polychromy, sculpture, architecture, dancing, and the drama. Some of these products appeal only to one sense, others appeal to several; but it will be found that there is only one sense which alone and unassisted can give an adequate idea of each. Hearing alone can reveal poetry and music; the former represents, the latter invents. Sight alone can reveal painting and polychromy; the former represents, the latter invents. Touch alone can reveal sculpture and architecture; the former represents, the latter invents, and so on.

It is a matter of psychology that a man who saw but never felt could have no adequate knowledge of architecture, and the fact that there is a blind sculptor in France, M. Vidal, shows that touch alone suffices to reveal the nature of both sculpture and architecture. It is true that binocular vision gives an idea of solidity, but only as a judgment, first in conjunction with touch and afterwards alone. It is true that the contraction of the ciliary muscle gives an idea of solidity, but by means of the muscular sense of the eye and not of sight, which is only a sensation of the retina.

The fine art of architecture is therefore the fine art of inventive form as affording pleasure, and therefore irrespective of the practical use, if any, of the articles invented. But the articles which have to be made for practical use are so numerous and important that the fine art of architecture has been occupied in so designing them that they may afford pleasure, rather than in designing beautiful forms irrespective of their practical use.

I have shown that although the material expression of a want satisfied is not necessarily fine art (because it may be as ugly as sin, and man will not have it so), since our Aryan forefathers made their first paddle or built their first hut on the upper Indus, or wherever else anthropologists may locate them, man has, owing to his constitution, been totally unable to exercise his constructive irrespective of his artistic faculty; whatever he makes, be it for shelter, locomotion, defence, or any other purpose, it must *please as well as serve*. It may please without serving, but it may not serve without pleasing, so that as a human achievment the material expression of a want satisfied is incapable of consideration irrespective of the material expression of a want, to some extent, beautifully satisfied.

Now what are our material wants? Amongst other things shelter, highways, clothes, vehicles, weapons, tools, pottery, glass, jewellery, and the like. The fine art of architecture, as the fine art of inventive form, embraces the art not only of the architect ashore and afloat, but that of the engineer, the lapidary, the swordsmith, and the potter; nay, even the tailor and the milliner.

When we bear in mind that many of the great Italian painters were architects, engineers, sculptors, and goldsmiths, and designed robes for religious and political functions, we see that all that can form the subject of pleasing design comes within the scope of architecture. Before the inevitable division of design had given rise to as many callings as now, when a Michelangelo or a Benvenuto Cellini could turn without effort from a picture to a storage reservoir, from a statuette to a signet, and science was little more than common-sense, one mind could compass the gamut of the crafts; but where shall be found the Admirable Crichton who can compass to-day those that minister to the wants of even a good hotel?

But on the other hand, it is universally recognised as a matter of business that one man must be made responsible for the design and execution of such works. Where two or more technical experts are employed by a non-technical individual or body, endless difficulties may arise, and the works which like the Tower Bridge can be success-

fully carried through from start to finish by such joint employment are few and far between. So much has this been felt that it is usual to entrust the guidance of co-operative work to a consulting architect or engineer whose administrative knowledge of the practice of the several experts contributing to the complete scheme is more than sufficient to ensure harmonious co-operation and efficient results. Such, for example, has been the practice of the Board of Control of lunatic asylums where, to quote the Portraine case, an architect, a waterworks engineer, and an electrical engineer were employed under the general administration of a consulting architect whose engineering experience peculiarly fitted him for this duty.

But even the cases where specialists, both architects and engineers, work under the generalship of a consulting architect or engineer must be comparatively few ; the amount of a particular class of engineering work in a whole mainly architectural, or of a particular class of artistic work in a whole mainly consisting of engineering, may not be sufficient to warrant the employment of a special practitioner ; and, as is often the case, there may be no independent practitioners in the class at all. In a large architectural work such as that instanced, it may be of advantage to employ not only an architect but also a waterworks engineer and an electrical engineer, or even a sewage disposal engineer. But what of the other special works in which an architect is not necessarily a finished expert—steam heating, hot water heating by steam injection, heating and ventilating on the Plenum system, steam cooking and laundry work, and hydraulic lifts and accumulators, works that not only necessitate detail drawings and specification but which rule plans and sections, and therefore sky-lines and general artistic effect, internal as well as external, to an extent which those who have never worked out a practical scheme involving them are quite incapable of realising.

There are no independent practitioners in these walks of what may be termed architectural engineering, so the scheme does not work, and various makeshifts—such as the submission to the sub-architect of a limited number of proposals from manufacturing firms, specialists it may be in heating, blowing, washing, or steam cookery plant, with the proviso that no remuneration will be given, but that the client or board may employ the firm who in the opinion of the sub-architect submits the best scheme, having regard both to efficiency and economy—have to be adopted.

Satisfactory, but by no means the best, results are thus obtainable. Every manufacturing firm who may be requested to submit a proposal introduces its own manufactures throughout, and every factor or general contractor for the execution of the particular class of work in question who may be similarly requested, introduces the manufacture of the firm with whom he deals, so that the excellence that results from judicious selection and combination is eliminated, and you have to put up, say in a laundry job, with Jones's hydro-extractors, Smith's ironers, and Robinson's rotary washing machines, whereas you know that Smith is not worth a rap except for hydro-extractors, that most ironers except Robinson's are a snare, and that Jones only shines in rotary washing machines, not to mention the fact that all of them may—as the best of them frequently do—endeavour to reduce their stock of mangles, things which are completely out of date in a steam laundry, and propose to convert your ironing-rooms into a Turkish bath by not encasing your ironing-stove in a glazed enclosure where its heat may be radiated to some effect in airing fine things, or to adopt such old-world devices as drying-horses, when the best practice is to kill two birds with the one stone by using the Blackman or some other system of drying.

Compromise with evil as this may be, there are worse devices which architects have been known to adopt in matters they do not understand ; they may say, for example, "Blowhard is a tiptop man for the Plenum system, I'll get him to work out the whole thing and give me a quotation, and I'll insert a money provision in the contract."

If an architect thoroughly understands the work and knows his man there may under some circumstances be no better method, but when he does not, how is he to judge of the reasonableness of the quotation or of the quality of the work? All that he can do is to fall back on a clause which should always be an additional rather than a sole safeguard, viz., that the contractor is to enter into a written guarantee to keep his work in complete working order for one year from the date of the final certificate, whatever that may be worth.

This is not the way to do business. Every genius has his weak points. An architect should extend his professional knowledge in every way in his power, but if he requires help in any particular let him be the consulting architect for the whole as well as the specialist in those branches of his work which he has at his finger ends ; let him engage a thoroughly good temporary assistant from a practitioner, a factor, or a manufacturer skilled in the work in question, or even another practitioner, and turn out complete drawings and specifications on which definite tenders may be invited. Not only will the tenders be lower, but the work will hang together as no patched combination of independent schemes ever can ; and as his practice in such work increases he will soon gain the administrative, if not the complete, acquaintance with the special work in question, which, coupled with intelligent observation and inspection of good examples elsewhere will render him what he professes to be when he takes his 5 per cent., a good all round architect with strong points rather than a specialist with weak ones, which is about the best account that many architects could honestly give of themselves.

The frequent presence of such men as I have mentioned in an architect's office is an unmixed good, for in no other way can his pupils and junior assistants so effectively pick up what may be termed the accessories of their main work, and avoid such painful errors as drawing a boiler-house without room to stoke, or an internal cornice in the path of the main steam pipe.

Architects should take a lesson in these respects from mechanical engineers and naval architects. The mechanical engineer who likes to see a neat moulding on his boiler-doors, or his steam gauges grouped under the shadow of a little pediment such as the Babcock & Wilcox Company affect, or the naval architect who embellishes his bows with the ubiquitous scroll, is as a rule content with such modest architectural attainments as his ordinary draughtsman may possess ; but when a Pullman drawing-room car or a liner's saloon have to be turned out, he gets the best assistance he can, because architectural detail is not in his line ; and the architect should go and do likewise. And with the more advantage, for it is ten times easier for an architect who can sketch to master a little corner of mechanical engineering, than for an engineer who cannot to acquire any artistic aptitude.

As I pointed out before, architectural practice melts into engineering, and the line that divides them, when it can be drawn at all, is very arbitrary ; there is no architecture that does not involve some amount of scientific design, no engineering that does not involve some amount of artistic design. The difference is in degree, not in kind. The most suitable practitioner, having regard to the particular work to be done, should be employed, and every architect or engineer should, temporarily or permanently as his wants dictate, employ a staff chosen so that their aggregate ability in regard to current work is uniform throughout that work.

Thus, and thus only, in the absence of an excellence and uniformity in attainments which it were vain to expect in any man, can the new architect earn his 5 per cent. If the Royal Academy can't assess him at his true value, the public can and will.

SOME PICTURE EXHIBITIONS.

THE Institute of Painters in Oil Colours still suffers, and probably always will suffer, from having more wall-space to cover than it can provide for ; but though there cannot be said to be any great work in the collection, there is perhaps a larger proportion than usual of pictures that can be looked at with pleasure. The President is certainly not at his best this year. His "Summertime" (10) is a weak and commonplace work even in regard to colour ; and the portrait of Mrs. Sidney (196), though very fine in the colour of the accessories, especially the rich crimson wall pattern, is stiff and expressionless as regards the figure. On the other hand the exhibition boasts one of M. Fantin-Latour's masterly and original conceptions, "Le Lever" (248), not equal to the beautiful little painting under the same name exhibited this year at the Salon, but nevertheless a piece of real poetry in figure painting, which may be compared with Mr. Kennington's merely pretty "Bathers" (254)—the ideal and the real in nude subjects. Mr. Melton Fisher gives the title "A Poem" to a half-length of a beautiful young woman in white (185) with a large hat forming a kind of dark halo (if the expression may be permitted) to her head, reading from a book as she walks. Of the same class, though with not nearly so much sentiment, is Mr. Godward's "Ethel" (237), a portrait of a very pretty girl in a purple velvet dress. Mr. Stock, who is a painter of ideas, goes rather out of his usual course in "Orion" (31), a half-length of a man in ordinary dress drawing a curtain from a window to show the dark-blue night sky and the constellation ; a suggestive idea spoiled by the want of sentiment in the figure. Sir Coutts Lindsay's very bad painting "Love in Bonds" (65), which we remember years ago at the Grosvenor Gallery, makes a second appearance here which could have been well spared. Among figure subjects of the *genre* order Mr. Lomax's "Foul Play" (173), an eighteenth-century group of men around a card-table, is really interesting from the varied and powerful treatment of the heads, which are full of vigour and expression. There is character and pathos in Mr. Walter Osborne's sketch of two or three forlorn figures "In a Free Library" (176) ; Mr. Chevallier Tayler's "Jack Ashore" (219) treats a well-worn subject with more refinement and less commonplace than one usually finds in pictures of a sailor and his sweetheart ; Mr. Edgar Bundy's "The Word" (339) is an effective painting of a group of theological puritans lighted through a green curtain in the window ; and Mr. Joseph Clark sends one of his small groups of rustics, "Nothing venture, nothing have" (447) in which each face is a study. Among more imaginative subjects, again, is one contribution from Mr. Watts, "In the Land of Weiss-nicht-wo" (303), two little nude infants who seem made of bronze or something else than flesh and blood, but with a charm of rich colour about the whole ; and Mr. Kennington's "A Study" (328), a half-nude woman kneeling with her head bowed in some affliction, is a suggestion which might be worked out into a fine picture. Mr. Wetherbee, the painter of landscapes to which a slightly-treated nude figure gives the keynote, shows a grand piece of colour in the landscape and sky in "Echo" (209), to which however the objection is that the figure representing Echo is hardly in an appropriate position for echo to act.

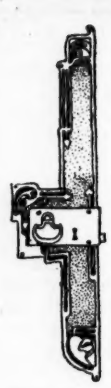
As usual, the good landscapes are more numerous than the good figure subjects ; many of them, it is true, just pretty and nothing more. One is conscious of the contrast between mere prettiness and originality, in coming across Mr. Bartlett's small work "A South Devon Ferry" (21), a real and complete picture in the true sense of the word, with the unity of treatment and feeling which characterises the work of a true artist. It is a strange lonely-looking scene, with the odd old ferry house perched on a rising bank, and a single figure pulling towards it in a boat. In Mr. Yeend King's "Lake Side" (42) we have Mr. Ernest Parton at second hand ; in Mr. John R. Reid's "A Dangerous Playmate" (56) a study, we imagine, on Southwold beach. Mr. Farquharson's landscape without a title (73) shows an effective study of foreground vegetation half-lighted through the trees, and a sun-lit meadow beyond ; the cattle not very successful. Under the title "The Village Smithy" (83) Mr. C. E. Johnson paints an effective night scene in which an expanse of moon-lighted clouds contrast with the red light from the smithy window. Mr. Archibald Reid, an artist at present less known than he is likely to be, has an excellent little landscape "On the Banffshire Coast" (91), not equal however to his larger work in Messrs. Tooth's gallery. Mr. Cotman's "Spring Meeting on the Orwell" (109) is a beautiful sunny landscape in which a collection of small yachts form an incident in the middle distance ; his "Flood Tide on the Orwell" (117) is also good, though not equal to the last named. Mr. Leader's "A Surrey Oak Wood" (145) is gratifying because it is somewhat of an escape from his usual mannerism.

Mr. Fulleylove's "The Acropolis from below the Pnyx, Athens" (132) is an important work, and interesting as being what may be called a realistic and topographical view, but treated in a grand and broad style and with great force of effect. With this we may group Mr. Aumonier's fine work "Sunrise from Primrose

Hill" (386) in which, on the other hand, an atmosphere of poetry is imparted to a familiar scene. Mr. Wimperis contributes three works in his well-known broad and powerful style (which, however, always seem like water-colour effects translated into oil), of which "The Moorland Sign-post" (460) shows an exceptionally powerful sky. There is certainly a great sameness in his compositions, yet they cannot be called mannered—it is something higher than that, and he may be said to be the best successor to the mantle of David Cox. Now Mr. Orrocks's "Old Bridge, Elstead" (376), on the other hand, is mannered; the foliage is painted in a kind of mechanical way which is not either Nature nor (in the best sense) art; in his two other works he shows, as usual, fine qualities of breadth and aerial effect. Among other landscapes worth note are Mr. Blair Leighton's "A Summer Morning" (194), Mr. Walter Osborne's "A Connemara Village" (199), Mr. Elias's "Valley of the Medway" (203), Mr. Arthur Hacker's "The Orchard" (257), a very peculiar work in which the sunlight effect is rather crudely represented, but still it is not commonplace; Mr. C. W. Wyllie's "An Essex Fishing Village" (276), admirable in colour; Mr. Leslie Thomson's "A Normandy Church" (402), a finely built-up landscape; and Mr. Withers's "Whittinghame Woods" (300), a wooded landscape in what may be called a revival of an old school, not without interest though a little conventional. Mr. Brewtnall's fiery red effects in such works as "The Impending Storm" and "The Last Load" (242, 260) are things we protest against; they are Danby over again, and Danby at his weakest.

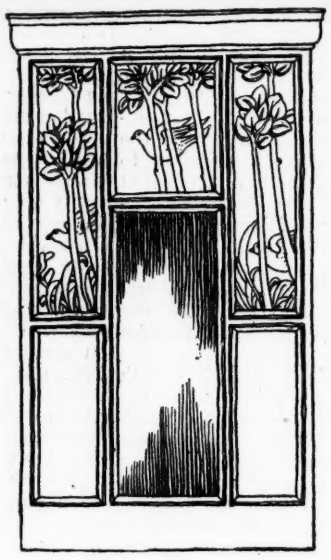
From the Institute it is a natural transition to the exhibition, at the Fine Art Society's Gallery, of the remaining works of one who was for many years one of the best exhibitors at the Institute Galleries. Those who had been accustomed to know Mr. Charles Green almost entirely as a painter of delicately finished *genre* pictures marked by a great deal of character and humour will be surprised to find that in the collection at Bond-street almost the best things are the landscapes, many of which, all of them works on a small scale, are beautiful, and reveal a side of this charming painter's talent which was almost unknown to the public. Considering the care with which he paints the accessories in his interiors it is not surprising to find a number of very careful studies of furniture, bits of interiors, architectural fragments, such as old gateways, &c., all of which are admirable, and quite worth having on their own account, although their main intention probably was to furnish backgrounds or accessories for figure subjects. Considering that Green, so far as we remember, never exhibited a nude subject picture the number of small and highly finished nude studies is also a surprise, and serves to show how carefully he studied his figures; but we do not think that in themselves they add to his reputation; they are merely realistic model studies, not always quite well drawn, and with no kind of sentiment imparted to them. The best in an artistic sense is the sketch of a seated figure (47) half turned away from the spectator. The little full-length, "A Bacchante" (70) is pretty. Of the kind of talent for which Green was best known there are many admirable examples in his sketches of figures of men and women, many of them studies for finished pictures; these are full of character; and one complete scene, "The Broken Window" (42), reminds one of Wilkie at his best. In the same gallery is a collection also of caricature sketches by Mr. J. F. Sullivan, the author of a series of satiric studies of "The British Workman" in we forget which comic paper, which will be long remembered. The drawings are very humorous and clever examples of caricature; whether they quite claim to come under the domain of "art" may be a question.

The small collection at Mr. McLean's Gallery in the Haymarket contains no work of very great interest; the best thing is Mme. Dieterle's "Cattle at Pasture," a thoroughly good work of its class. De Hoog's "Fisherman's Home" is a kind of second-hand Israels, good enough in itself if one could forget Israels. Werterbeck's landscape and cattle pictures have very good qualities, for which he owes something to Mauve; and Bisschopp's interior, "A Dutch Home—The Young Mother," is a very good work of its class. There is also a picture by Munkacsy, "The Nursery," to which we may apply President Lincoln's phrase—"For those who like that sort of thing, it is just the sort of thing they would like." Messrs. Tooth's exhibition next door includes the really fine and original work by Mr. A. D. Reid already referred to—"A Highland Farm," a work possessing real "style," and of the best kind. There are two small Corots, one of them a beautiful work, and a fine little landscape of Daubigny's; Mr. Leader is seen at his best in "Surrey Sheep Pastures;" and there is an admirable example of Mr. H. W. B. Davis, "On the Upper Wye," which, like Mr. Crofts' "Charles II. at White Ladies," we seem to have seen before; and Mr. Marcus Stone's "Love at First Sight," which, whether one has seen it before or not, is exactly like a great many other pictures by the same hand. One of the best things in the room is Mr. Blinks's small picture "Here They Come," a set of foxhounds scampering up to the foreground with a swing and go in their action which is admirable; the subject is not of much interest in itself; but it is first-rate work of its kind, and that is always interesting.



FINGER-PLATE BY T.E.C CARR

FINGER-PLATE BY JAMES SMITHIES

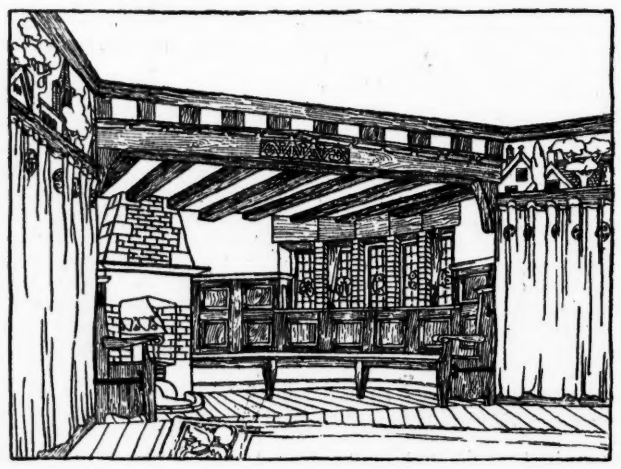


OVERMANTEL IN WOOD AD BRASS REPOUSSÉ BY W JAMES GEO NEIL. & A.J KERR T.E.C CARR

WROUGHT IRON CABINET FURNITURE BY EDGAR WOOD

LEADED LIGHT BY A. McPHERSON

AT THE ART & CRAFT EXHIBITION MANCHESTER SKETCHED BY W.E.EDWARDS SPROAT



DESIGN FOR AN INGLE-NOOK BY B. SCHWABE

A CHRISTMAS CARD BY B SCHWABE

SKETCHES AT THE ARTS AND CRAFTS EXHIBITION, MANCHESTER.

THESE sketches, by Mr. W. E. Sproat, of Liverpool, may be interesting as a reminiscence of the recent Arts and Crafts Exhibition at Manchester, which contained much interesting work, and will probably have been the beginning of a new impulse to decorative art in that neighbourhood.

APPOINTMENT.—**Mr. A. J. Dickenson, of the Building Department, Sheffield City Surveyor's Office, has been appointed Borough Surveyor and Water Engineer of Pwllheli, North Wales.**

THE ARCHITECTURAL ASSOCIATION:

EXCAVATIONS AT THEBES.

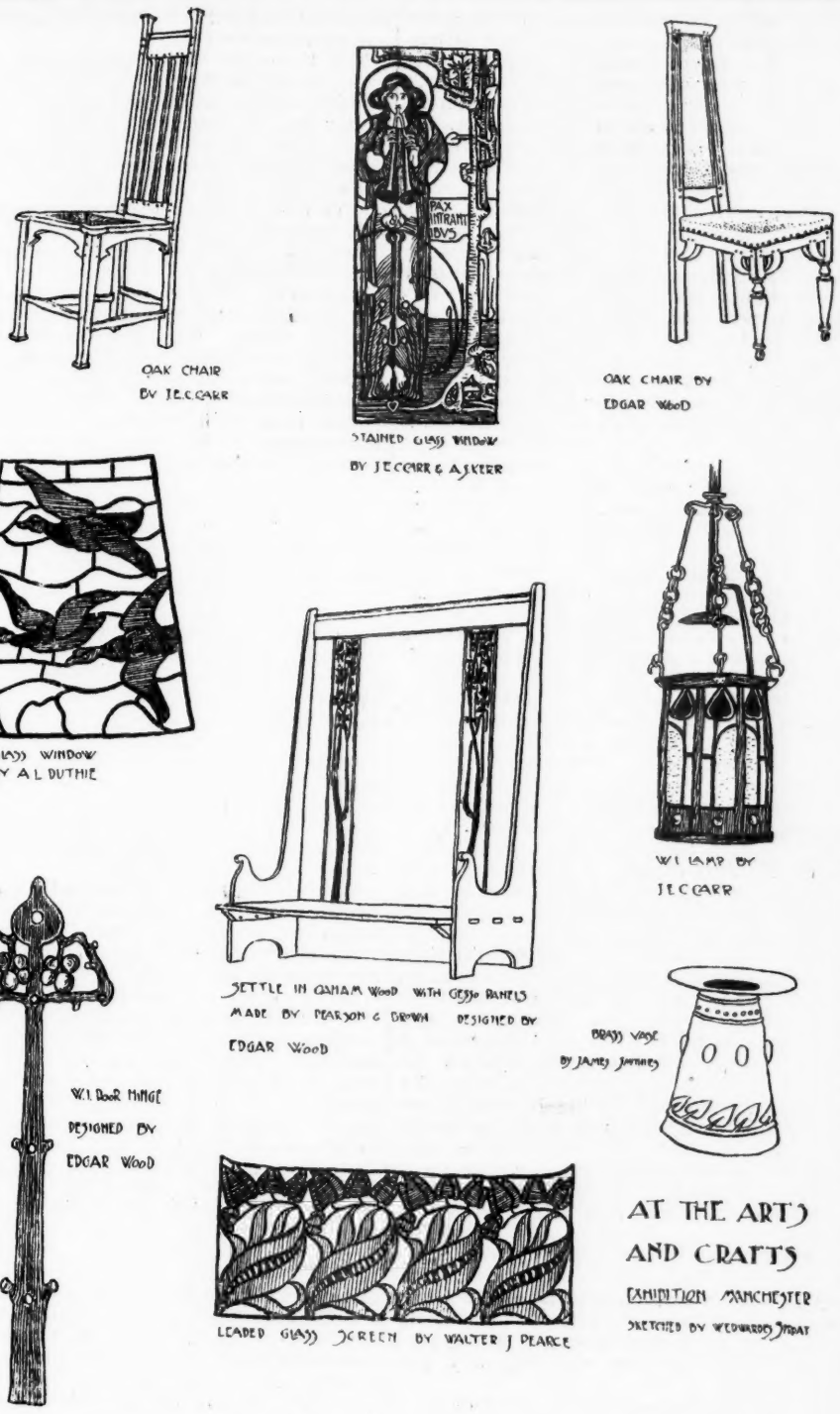
AN ordinary fortnightly meeting of this Association was held on Friday evening last week in the Meeting-room of the Royal Institute of British Architects, No. 9, Conduit-street, Regent-street, Mr. G. H. Fellowes-Prynne, President, occupying the chair.

The minutes of the last meeting having been read and confirmed, the following gentlemen were elected members of the Association:—Messrs. D. Good, A. R. Brown, E. A. Agutter, Leonard Judge, P. J. Turner, F. G. Allsopp, T. B. Ball, H. R. Bird, E. D. Ford, H. J. Gravenor, R. Knott, J. Mansell, H. J. C. Marshall, E. J. Martin, G. J. Morriss, C. P. Moss, J. Myers, S. V. North, W. Paice, jun. A. G. A. Quibell, R. M. Reeves, F. V. Rider, W. H. Rogers, G. L. T. Sharp, G. S. Simpson, M. Skinner, C. F. Skipper, W. Thornton, J. E. Tindall, H. M. Whiddington, C. S. Yates, C. E. Simmons, C. H. Smith, A. Durst, E. Brantwood-Muff.

The Chairman announced that the following gentlemen had been reinstated, viz., Messrs. E. E. Fetch, E. C. Nisbett, and G. G. Wallace.

The Chairman then nominated Messrs Alfred H. Hart and H. A. Satchell for seats on the committee, in accordance with by-law 35. As no other nomimations were received, these gentlemen will be elected at the next ordinary meeting.

Mr. Howley Sim proposed a vote of thanks to those gentlemen who assisted in making the recent conversazione at King's Hall a success, viz., glee singers: Nessrs. G. Dixey, J. Charrington, F. A. Ellis, and G. May; for exhibits, Messrs. Martin Bros., Doulton & Co., and De Morgan & Co.; and for the loan of pictures and drawings, Sir Wyke Bayliss, and Messrs.



Axel Haig, H. W. Brewer, A. W. Weedon, and the Water-colour Class. With the vote of thanks, which was heartily agreed to, the name of the Hon. Secretary of the Entertainment Sub-Committee, Mr. G. B. Carvill, was associated.

Mr. Sim also proposed a vote of thanks to Mr. Arthur Cates for a donation of office fittings, forty books, &c. This having been agreed to,

The Chairman called on Mr. J. E. Newberry to read the following paper, entiled "Excavations at Thebes":—

WHEN the Committee of the Architectural Association asked me to read a paper on "Excavations at Thebes," I accepted without much thought of the great range that such a generalised title might be taken to embrace; for the site of ancient Thebes is the place of all others in Egypt where digging for antiquities has been carried on from the earliest times. Professor Petrie remarks that what we now find are but the last leavings of a hundred generations of incessant pillage. But this paper will only deal with the excavations that I personally assisted in making during two seasons' work for the Egypt Exploration Fund, and, by the kindness of the Committee of that Society, I am able to show you a series of lantern slides from photographs taken whilst we were unearthing the Temple of Hatshepsut, now known as Deir-el-Bahari, or the Convent of the North. The result of this excavation, to quote an article in the *Edinburgh Review*, "has been to give back to the world a temple which, though ruined in some parts, unfinished in others, is, perhaps, the most beautiful, certainly the most original in Egypt, and the earliest of those now standing on the plain of Thebes."

I propose to divide my paper somewhat as follows:—

First, a description of the site and surroundings of our work, with a few slides in illustration. Second, a brief sketch of the vicissitudes that this temple has passed through, which, to be intelligible, must include a recital of a few of the facts of ancient Egyptian history.

Then I will endeavour to describe our mode of work; the architecture of the building and its details; and finally will show you photographs of a few of the antiquities that have been discovered there.

The site of the ancient city of Thebes in Upper Egypt is now marked by Arab villages, the principal being Luxor, Karnak, and Gournah, some 450 miles from Cairo by the river. When I returned from there in 1894, the railway alongside the Nile from Cairo only extended to Sohag, but now it passes through Luxor and Assuan, on the way to Khartoum.

But no one should attempt a first visit by train if he can possibly afford the time and extra expense of going by steamboat or better still by dahabiyeh. The *Edinburgh Review*, in the article which I have already quoted from, aptly remarks that: "One cannot journey into the past of some four thousand years ago in thirteen hours of noise and dust. Five days on the Nile post-boat give a more fitting preparation, with their uninterrupted hours on a glassy water, through a landscape monotonous enough, but with a strange incomprehensible fascination of its own."

To continue the quotation in the writer's own poetic words: "As one goes further south, the colouring becomes more vivid; the hills are no longer tinted with pale pink and purple, but glow at evening with the colour and transparency of a sunset cloud, or like snow peaks with their rose light and aerial blue shadows. At last, where the hills, no longer flat-topped, but with sharp peaks and jagged outline, open out round a fertile plain deep in corn, one comes to Luxor. It is sunset when one arrives by the post-boat; the sky glows behind the Libyan hills, the water towards the west is a sheet of gold and crimson, the pylons and obelisks of Karnak rise black on the left. Under the hills on the west bank one can faintly trace the white terraces and colonnades of Deir-el-Bahari; the Colossi are no more than two misty points against the hill; the giant pillars of Luxor stand out against the purple sky where night rushes up from the east; and Thebes is reached."

To give a clear conception of the position of our work and its relation to the surroundings I have here a map of a part of the Theban district taken from Lepsius' "Denkmäler." It will be seen that on each side of the Nile stretches a belt of fertile land; it is much wider on the east side, extending for perhaps four miles from the river to the mountainous desert of the Arabian hills beyond. Here by the river are the remains of the mighty temples of Karnak and Luxor, created for the worship of Amon, and the work of many generations. On this side stood the ancient city of Thebes. It will be seen that the map shows the cultivated land on the west side to be only a narrow strip, which ends as abruptly at the foot of the barren limestone cliffs as a lawn adjoining the gravel walk in a garden. Egyptian tombs were always placed in the desert, partly that they might be beyond the reach of the Nile, and partly because every inch of cultivated ground was, and is, so valuable. The hills here are regularly honeycombed with tombs, and this western side is simply one vast necropolis, the biggest in the world. The northernmost cliffs, known as the "Drah abu'l Neggah," contain the earliest tombs. To the south-west is the entrance, a narrow gorge, to the natural amphitheatre of cliffs in which the temple of Deir-el-Bahari is situated. Beyond in the desert is the wonderful valley of the Tombs of the Kings, approached either by a ravine north of the "Drah abu'l Neggah" or by a steep mountain path over the cliffs. On this side of the river are also the Ramesseum, the temples of Seti I., Medinet Habu, Der el Medineh, as well as the famous Colossi. Lepsius believes that the temple of Deir-el-Bahari was formerly connected with Karnak, since the axis of the prolonged dromos would lead straight to the great temple of Amon. The remains of the Sphinx Avenue, from Karnak to Luxor, can be traced, and in places the ram-headed monsters are still to be seen.

The ancient Egyptian name of the city is read as Uas and its scriptural name was No, or No Amon, the city of Amon; no satisfactory explanation has been given as to why the Greeks called it Thebes, a name borne by cities in Bœotia, Attica, Thessaly, Cilicia, Asia Minor, &c.

It will be convenient here to briefly remind my audience that Egyptian history is divided into dynasties:—These are grouped into the *Ancient* kingdom, including the I. to VI. dynasties, the *Middle* kingdom, XII. to XVI., and the *New* empire, XVII. to XX., which is dated at 1600 B.C. to 950 B.C. Following this is the period of foreign domination, XXI. to XXV. or 950 B.C. to 663 B.C.—the late Egyptian period, XXVI. to XXX. or 663 B.C. to 332 B.C., and the Græco-Roman time which includes the Ptolemies, the Romans and the Byzantines, from 332 B.C. to 640 A D.

The history of Thebes under the Early empire is veiled in uncertainty, but it is known to have been the capital of a nome or province and was ruled by princes of its own. A VIth. dynasty tomb has lately been discovered in the Drah abu'l Neggah by my brother, Mr. Percy Newberry. In the Middle kingdom, Thebes rose to a more commanding position, but its greatness dates only from the beginning of the New Empire, or, say, 1600 B.C. The liberation of the country from the Hyksos

and the reunion of the kingdoms of Upper and Lower Egypt was directed from Thebes, and for centuries it continued to be the favourite seat of the Pharaohs. Historically, the interest of Thebes centres on one of the most fascinating periods of Egyptian history—the XVIIIth. and XIXth. dynasties, being the time of the Amenhoteps, Hatasu, or, more correctly, Hatshepsut, the Thothmes, Seti, the Rameses, and Merenptah, of Israelitish fame.

But the sun of Thebes began to set when the Royal residence was transferred to Lower Egypt in the XXIst. dynasty. Alexander the Great and the Ptolemies probably found Thebes still a great, though decadent city, but they assisted to embellish it, as some buildings of this period attest. After many rebellions, the great city revolted for the last time in 30-29 B.C., taking part in the insurrection of Upper Egypt against the oppressive taxation of the Romans. Cornelius Gallus, the prefect, overthrew the rebels, and is said to have utterly destroyed the ancient town.

From this time Thebes is only mentioned as a goal for inquisitive travellers, who, under the Roman emperors, were attracted to the Nile by two monuments in particular, the Pyramids, and the musical Colossus of Memnon. The introduction of Christianity and the edicts of Theodosius were followed by the destruction of many pagan statues, and the obliteration of countless inscriptions. Later the rock-cut tombs, at first occupied by Christian hermits, were converted into peasants' dwellings; Christian churches were erected in the temple halls, and mud-brick houses built between the columns of the Temple of Luxor. Carefully worked blocks and slabs were removed from the monuments, which were used as quarries, and much beautifully carved limestone has been burnt for making lime.

In considering the history of the temple of Deir-el-Bahari we must first glance at what we know of the reign of its great founder, Queen Hatasu, or Hatshepsut. In the first excavation of the temple it was not at once discovered that she was its founder, as in nearly all the inscriptions the name of her successor, Thothmes III., has been substituted for that of hers. But further observation has shown that, although she is always depicted on the reliefs in *male* attire, the personal pronouns in the inscriptions are *feminine*, and the names of the king were incised deeper than the surrounding hieroglyphic signs. Such usurpation is not uncommon among the Egyptian kings, but the persistence with which every trace of the queen's reign has been erased seems to point to something more than the mere desire for fame. This destruction is attributed to the queen's nephew, Thothmes III., and the reason may be found in the history of the succession. Professor Petrie in his "History of Egypt" says that the father of Hatshepsut, Thothmes I., died before he had a son old enough to succeed him on the throne; some five or six months before his death, and whilst he was probably in failing health, he associated his daughter with him, as she was the heiress in the female line, in which royal descent was specially traced. She was then about twenty-four years of age and of great capacity and power. Two or three months later the king married her to his eldest son, Thothmes II., who would otherwise have had no claim to the throne, being the son of Mutnefert, who was not a royal princess. Ten weeks later Thothmes I. died. His son, who was now king in name, was but seventeen years old, appears to have shown no abilities, and must have been a weakling; for he did not go on any campaigns, undertook no wars, in fact, did no great work of any kind, and at thirty he died. During his life his sister probably entirely organised public business, and at his death she was left sole legitimate ruler at about thirty-seven years of age; the only person who could challenge her power being her little nephew, Thothmes III., then, perhaps, nine years old. He had no claim to the throne, being the son of a woman named Isis or Aset, who was not of royal blood. But Professor Petrie considers that his aunt did all she reasonably could be expected to, for she associated him with her in the kingdom, public dating of documents was carried on in his name; and she married him to her second daughter, Meryt-ra, as soon as might be, and thus gave him the position of heir. If she held on firmly to her royal prerogative, she only did what any other capable ruler would have done.

No doubt it was galling to a very active and ambitious young man to be held down to peaceful pomp and routine. . . . But, to quote Professor Petrie again, all things come to him who waits. Egypt developed greatly during this twenty years of peace and progress, and at the Queen's death, Thothmes III., now thirty-one years old, succeeded to the full power. He was then able to launch into that mighty series of campaigns which mark the highest extent of Egyptian power and which gloriously occupied twenty-eight years of overflowing energy.

We can now form some idea of the force of character and ability of Queen Hatshepsut by the fact that she is, as far as we know, the only woman in the great historical period that overcame the prejudices of a changeless people and broke the male line of succession. By one means or another she kept her throne and only after many years could her mighty nephew wreak his vengeance on her monuments.

But Hatshepsut's temple suffered at other hands than Thothmes III. Amenophis IV., Khuenaten, or, as the name is now read, Akhenaten, the so-called heretic king, hacked out here, as everywhere, the figures and names of Amon-Ra, and the inscriptions and reliefs were left thus mutilated until the time of Rameses II., who restored them, though in a style unworthy of the first hand. For centuries after the temple remained practically unaltered, though there are evidences that the unfinished northern colonnade was used by a colony of embalmers as early as the XXIInd dynasty, and many burials have been discovered in this part of the XXVIth. dynasty. Under Ptolemy Euergetes II. a few minor restorations and some important additions were made. On the introduction of Christianity a community of monks established themselves, and founded a Coptic convent, known to the Arabs as Deir-el-Bahari, which was built with bricks brought from an edifice of the XXVIth. dynasty at the Assasif. The chambers of the temple were converted into chapels, and the "heathen" representations on the walls barbarously defaced.

The earliest detailed description of the place is given in the account of the French expedition of 1798, and later on we read of it in the works of Wilkinson, Lepsius, and Mariette, the latter of whom undertook important excavations in 1858, and published a monograph on the temple.

But it was reserved for the Egypt Exploration Fund, under the able guidance of M. Naville, to bring to light one of the most interesting temples of Egypt, of which up to 1892 two-thirds were covered by mounds of rubbish that reached to a height of 40 ft. in places.

As I am addressing an architectural audience I cannot do better than begin my description of the temple with a ground plan. This only reaches as far east as the lower colonnade, the excavation of the lower part not having been commenced when the drawing was prepared.

The plan is very remarkable, quite different from all other temples in Egypt, and was probably suggested in great measure by the site.

It consists of three great terraces or platforms cut out of the east slope of the mountain, and rising one above the other from the level ground, the upper platform being backed against the vertical cliffs, which here rise to a height of 384 ft. Centrally placed sloping ways, or inclines, lead from terrace to terrace, and along the front of each terrace the ceiling stones of the one above were carried over on the top of a double colonnade, thus forming a kind of cloister underneath. The upper and part of the middle platforms are terminated by a series of chambers, excavated and then built into the solid rock.

The sphinx avenue, some 24 ft. wide, with trees planted at intervals, led from the plain, or perhaps the river, to the gateway of the lower court, or entrance to the temple precincts, and formed a continuation of the axis of the temple, running approximately east and west. Only the scantiest traces remain, but these are enough to show that the gateway or pylon had a tree on either side, the stumps of which still remain. This first court, or *lower platform*, measures about 325 ft. by 263 ft. wide; and the excavations have proved that it was treated as the garden or orchard of the temple; round pits cut in the rock some 10 ft. deep have been discovered full of Nile mud with the stumps of palm or apricot trees still in them. The western colonnades are in ruins, but we can see that they each consisted of twenty-two pillars, arranged in double rows. The back row were sixteen-sided and the front row seven-sided at the back and square in front.

The top of the stone ceiling of this colonnade formed the floor of the court above, the *middle platform*, which is at a level of 21 ft. higher up. It measures roughly 279 ft., by 250 ft. wide. On the west it is bounded by a double colonnade, each side consisting of eleven pairs of square pillars. Two steps at the north end of the colonnade descend to a hypostile hall, in which are twelve sixteen-sided columns arranged in three rows, which support massive architraves and a flat stone ceiling. Three steps lead up to the shrine of Anubis, consisting of three small chambers, with elliptical vaulted ceilings. On the north side of the court is a colonnade of fifteen sixteen-sided columns, and in the wall behind are four small vaulted chambers. The south side of this middle platform is supported by a retaining wall ornamented with wide, flat pilasters, surmounted by alternating hawks and urasi of colossal size.

To the south-west of this court, and at the same level, is the little shrine dedicated to Hathor, goddess of the dead. It has since been found that this was reached only from below, by a flight of steps, of which a few traces still remain. The innermost chambers are hewn out of the rock, and are preceded by two covered vestibules, which are now in ruins. The first had sixteen-sided columns and four square pillars with semi-circular attached shafts, terminating in Hathor-headed capitals, the remains of which are now lying shattered on the ground. The second vestibule, at a slightly higher level, has four central columns with round shafts and sixteen sided columns on either side. The shrine proper is raised two steps, and consists of three chambers, each with several niches surrounding it.

Here we find conformity with the same law which prevails in hypæthral temples, and which M. Perrot has named "the law of decreasing dimensions." Thus from portico to sanctuary the dimensions of the building decrease in every way and the floor itself rises. The innermost room contained the sacred emblem of the goddess, perhaps a golden cow, enclosed in a tabernacle or shrine. The sacred boat, which bore the tabernacle, was probably kept in the room immediately preceding. The various lateral niches were used, it is supposed, as store chambers, to serve for offerings, the divine vestments and all the sacred furniture.

We now ascend to the level of the *upper platform*, which is again 21 ft. higher up. The terrace in front of the central court had a row each of square pillars and sixteen-sided columns as remains show on the north side. A granite doorway leads to this central court, 83 ft. by 121 ft. wide, which it is now considered had a double row of columns around it. The ruins of the porch to the sanctuary are of Ptolemaic date, and lead to a hall with semi-circular vaulted roof and two chambers beyond; the westernmost chamber is a restoration by Euergetes II., in which the reliefs and inscriptions compare very unfavourably with the masterly sculptures of Queen Hatshepsut. The western wall of this central court is built against the steep cliff of the mountain and pierced with a series of niches. In the northern wall is a doorway leading to a vestibule which had three sixteen-sided columns in it. Opposite the door is a small niche, the upper part and ceiling of which had been displaced by falls from the cliffs above, and which I have rebuilt. To the west of the vestibule is an open court in which is found the only altar that has come down to us from Egyptian antiquity. A door in the north wall of this court admits to the funerary chapel of Thothmes I., consisting of two chambers built into the cliff. The Hall of Amon, to the west, is approached only from the upper court, and part of its flat ceiling still remains in position.

On the south side of the central court are several chambers, now in ruins, and a well-preserved sacrificial hall with a portion of the semicircular vaulted roof still standing. This part of the temple was not completely cleared until the season after I left, and I am unable to describe it completely.

All the excavations in Egypt are regulated by the Governmental Department of Antiquities. The permit granted to M. Naville on behalf of the Egypt Exploration Fund, I believe, stipulated that the Society should undertake to completely uncover the whole temple, and also do any building work that might be neces-

sary for maintaining or re-erecting the old walls.

This is not the usual method in which private excavations are carried on in Egypt. A series of trenches is often all that is required to explore an ancient site and discover all the antiquities that may be buried upon it. But in our case it was necessary to remove the rubbish and dust, accumulations of centuries, to a considerable distance from the temple; and it was also found that when the support of the surrounding earth was taken away from some of the walls that they required strengthening.

Owing to the kindness of M. de Morgan, the then Director of the Department of Antiquities, we had all facilities granted us for carrying on the work; and he placed at M. Naville's disposal a quantity of Decauville trucks, and quite half a mile of tram lines, with all the necessary curves and points for making a complete railway.

The general view of the temple taken before our excavations will show that the mounds rose very considerably towards the west; it was, therefore necessary to arrange a system of tram lines on three different levels, each of them having only a slight gradient, and some 20 ft. above one another. The rubbish was taken in trucks from the highest mounds and tipped on to the next level; from thence it was loaded up again, and tipped down to a lower level, where another system of trucks carried it some quarter of a mile away from the temple to a natural hollow called by the Arabs "birket," or lake. During the two seasons that I was in Thebes a matter of 60,000 cubic mètres of rubbish and stones were thus carried away from the temple, a feat that would have been impossible without the aid of a tramway.

This arrangement, necessitating the loading up of our trucks three times over, was criticised by some of the visitors that came to the temple, but I do not see how it could have been much improved upon. A steeper gradient would have been dangerous with such workmen as we had to deal with, who, in spite of all warnings, would push their trucks too fast, and thus run them off the rails, damaging themselves and our rolling stock at the same time.

Here, at Deir-el-Bahari, the diggers, drawn from Theban villages, have many of them been tomb-robbers from their infancy, and, consequently, have lynx eyes for small antiquities. The actual digging is done by men with an implement like a short hoe or adze, called a "tooriyeh," with which they scoop the dust and rubbish into their palm-leaf baskets. Boys then carry these baskets to the trucks, which are drawn up close by, and bring them back to be filled again. Three or four men were in charge of each truck and pointsmen were stationed at various places. These latter posts were a good deal sought after, as the man in charge had only to push or pull the rail with a hooked stick. He could thus pass his whole day seated and smoking. We employed on an average 250 men and boys a day, with eight reises or overseers, one head reis to manage the railway —a clever Pyramid Arab, and a Coptic scribe who entered the names each morning and kept the accounts. The wages were, for a day lasting from sunrise to sunset, boys, 1½ piastres (3¾d.) per day; men, 2 piastres (5d.), and 3 piastres (7½d.) for the reises. Occasionally the order was given to search each man before he left the works, as a preventive against their stealing small antiquities, but we did not succeed in finding anything concealed upon them.

Another general view of the temple, taken after our excavations in 1895, shows the magnitude of the work and the degree of success that has been attained.

It may be interesting to note here that the great tomb cave in which the celebrated find of royal mummies was made is always spoken of as being at Deir-el-Bahari, but it is nearly half-a-mile to the south, between the hills of Sheikh Abd-el-Gournah and the cliffs of the Libyan mountains. In the XXIst. dynasty, during a time of political trouble, it was resolved to protect the royal mummies from the chance of robbery by interring them altogether in this tomb cave. Corpses of the ruling dynasty were also placed here and all left in peace until 1875 when some Arabs discovered the well-hidden resting-place. The fellaheen kept their secret until 1881 when they were traced, and Brugsch Bey had all the mummies conveyed to Gizeh. A few yards north of the lower court is a square well-shaft forming the entrance to the common tomb of Theban priests of the XVIIth. to XXth. Dynasties, which yielded a rich treasure to the Gizeh Museum in 1891.

During our first season M. Naville and myself lived in an Arab house in the village of Gournah, a good mile from the temple. This was found to be very inconvenient, and as the work was estimated to take several years for its accomplishment, the Egypt Exploration Fund decided to build a house quite close to the temple, which should be the headquarters of the staff. I accordingly designed a building which had a central courtyard with a dining-room overlooking the temple, five bedrooms, two storerooms, kitchen, and bathroom arranged around it. The foundations were of rubble stone laid in Nile mud mortar, the walls of mud brick, some of them being brought from the monastic buildings that we had to pull down to clear the temple. These in their turn had been pilfered from a XXVth dynasty building some 500 yards away. We found a few of them bearing the name-stamp of an officer of the XXVth dynasty, known from an inscription at Karnak as "the fourth prophet of Amon, the Prince of Thebes, the Governor of the South, Mentuemhat. The bricks measured 12 in. by 6 in. by 4½ in. thick, and probably only one in every hundred or thousand was stamped. The roofs were flat and ceiled with rafters and boarding on which was laid a layer of mud bricks on chopped straw, and the whole plastered over with mud mortar. The walls were roughly plastered inside with a mixture of lime, sand, and chopped straw, the lime having been burned in a native kiln, which I had made close by. The floors were of ancient red brick, floated over and set with a mixture of powdered burnt brick and lime. The joinery, with a few exceptions, was entirely of native make, the doors and windows being hung on wooden pivots, the former being fastened with beechwood locks and keys. As the house has been used every season since it was built in 1893 by members of the staff of the Egypt Exploration Fund, it has well justified its existence. The great work of copying all the reliefs which cover the temple walls is not yet finally completed, and Mr. Carter, the artist, has already taken up his abode at Deir-el-Bahari for another season's work.

In considering some of the details of the temple, we may begin with the lower terrace, on a part of which are a few stones depicting the transportation of two great granite obelisks. Various fragments belonging to this most interesting scene have been discovered in the Coptic buildings which had to be removed, and it is now possible to piece them together sufficiently to show that the obelisks were placed on a great, boat-like barge. This was towed by thirty large rowing-boats, arranged three abreast and in lines of ten. There were thirty-two oarsmen in each boat, so that, adding officers and steersmen, the crew which towed these obelisks from Assuan to Thebes numbered quite 1,000 men.

A diagram showing a partial restoration of this scene, drawn by Mme. Naville, appeared in the Archæological Report of the Fund in 1895-1896.

Whether these obelisks were destined for Karnak, this temple, or elsewhere I cannot say. One of Hatshepsut's obelisks at Karnak is still standing; it weighs about 300 tons, and the inscriptions mention that these two monoliths were quarried and erected complete in seven months. Professor Petrie believes the pair at Deir-el-Bahari to have been put up by Thothmes III., and identifies the top of one of them at Constantinople. He calculates the weight of each obelisk at the enormous figure of 800 tons.

We now ascend to the *middle platform* and examine first the sculptures on the southern half of the terrace. The twenty-two square pillars which supported the ceiling are of a slightly tapering form with delicately-rounded arrises. The scenes on the walls commemorate an expedition to the Land of Punt, which is supposed to lie on the west coast of the Red Sea, corresponding with the modern Somali coast. Incense, panther skins, ivory and ebony were among its chief exports to Egypt. A village in Punt is shown, the houses of which are built on piles over water, amongst palms and incense trees, and ladders lead up to the doorways. We see the Egyptian fleet setting sail, and above, its arrival in Punt. Farther on the Queen, followed by her guardian spirit, dedicates to Amon the spoils of the expedition. Cattle are shown feeding beneath delightfully conventional trees (see illustration). Gold and electrum is weighed and incense is measured in the presence of the gods.

On the corresponding northern half of the same terrace, the scenes refer to the birth of the Queen, but unfortunately in every case the figure of Hatshepsut has been defaced, though that of her mother Aahmes has been respected. Her admirable portrait is probably the finest piece of work remaining in the whole temple. Though, like all the sculpture, it is in very low relief, the admirable modelling of the delicate and refined features, and the smiling expression, give to the face a beauty which bears witness to the skill of the Egyptian artist, and makes one regret that so little has been left of the original work.

A great feature in this temple are the so-called Proto-Doric columns. Those in the Hypostile Hall are sixteen-sided, measuring 2 ft. 7 in. in diameter just above their shallow circular bases, and they are 15 ft. 9 in. in height, tapering to an upper diameter of 2 ft. 4 in. The abaçus is square and flush with the shaft, and a simple band of hieroglyphics appear on one face. Proto-types of this form are to be found in the rock-cut tombs of Beni Hasan, which differ only in having fifteen of their sides fluted like a Greek-Doric column, and one left flat to receive the dedication inscription.

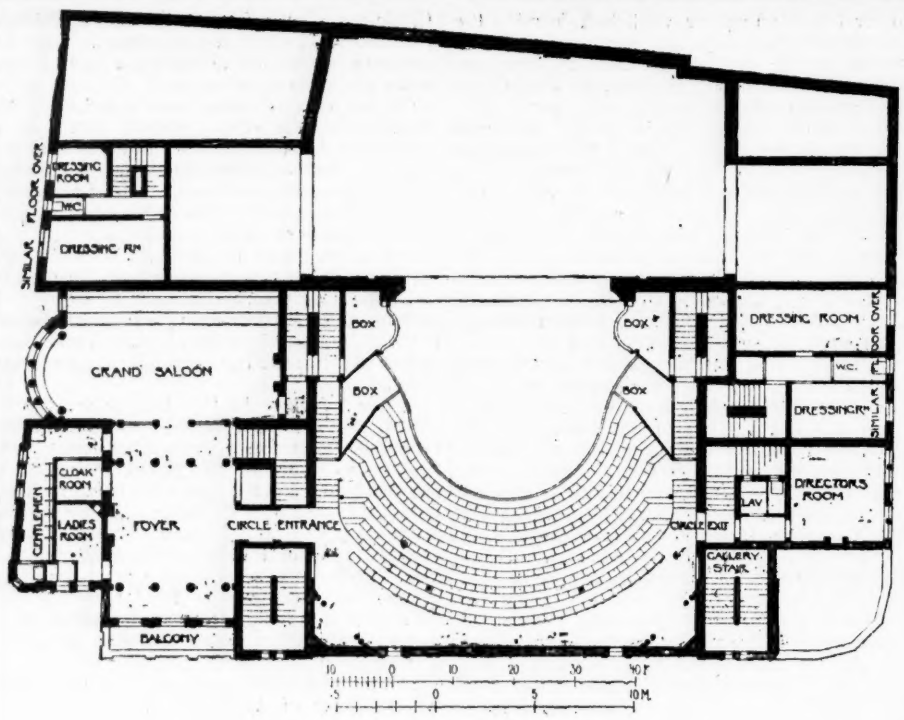
This Hypostile Hall, which forms a vestibule to the Shrine of Anubis, is in a very perfect state; the flat stone ceiling, resting on massive architraves, and the supporting columns, are all intact. The ceiling is painted blue and powdered with yellow stars. The spacing of the columns is wider in the centre, so as to form a better approach to the chambers beyond.

The granite doorway leading to the central court is one of the most striking features of the *upper platform*. It is specially interesting in that it shows clearly the erasures around the cartouches which bore the Queens' names, "Ma-ka-ra, Hatshepsut," but which now read "Ra-men-Kheper, Tehutimes," the names of Thothmes III. Where these alterations occur one can see plainly that the surface of the granite has been rubbed down to admit of new signs being inscribed. But, irrespective of erasures, Egyptologists are able to prove that the Queen's cartouches must have been there by the fact that the surrounding inscriptions are in the *feminine* gender. That great doors were once hung here is shown by the pivot and bolt holes on the inside.

A somewhat similar granite portal on the further side of the central court leads to the Sanctuary, a narrow hall with a semi-circular stone roof. These curved vaults occur in several parts of the building, and are not true arches, but built with horizontal joints, forming really a series of corbels curved on the inside. Nevertheless, it appears quite certain that the Egyptians understood the principle of the arch, and used it in brick buildings. The so-called granaries of Rameses, behind the Ramesseum, are notable instances of arched constructions of the nineteenth Dynasty; but last season Professor Petrie unearthed a mastaba, or built tomb, at Denderah, with three ring brick arching to it, which belonged to a prince named Adu, who lived under Pepy II. of the sixth Dynasty—at least 4,000 and perhaps 5,000 years ago!

The great stone altar which stands in the middle of the Altar Court, is one of our most interesting finds. It is a rectangular structure of fine white limestone, measuring about 16 ft. by 13 ft. At the western end is a flight of ten steps leading to its upper surface, 5 ft. 2 in. above the floor. It is crowned with the usual bold cornice so common in Egyptian architecture, consisting of a large bead and cavetto moulding, and a similar bead to that on the cornice is worked on each angle of the altar mitreing with the cornice bead. The proportions of the steps leading up to the altar are worth mentioning, having a rise of 6·2 in. and a tread of 19·1 in.; but the treads are not level being "kilted," or inclined as much as 1·85 in. The height of each riser is thus only 4·25 in. The Altar Court was evidently always open to the air, and its walls are consequently uninscribed and quite plain. They are built to a batter, as are most walls in the temple, and were finished with an overhanging cornice. I carried out some considerable repairs here, consisting of rebuilding portions of the walls and altar, and forming rough retaining walls against the loose and friable cliffs on the north.

(*Continued on page* 409.)



The Crown Theatre, Peckham. Plan.

Illustrations.

THE CROWN THEATRE, PECKHAM.

WE give a view of this theatre, which has just been completed from the designs of Mr. E. A. Runtz.

The accompanying plan explains the general arrangement of the house, which has its auditorium and stage rather curiously placed on a central axis at right angles to the longest side of the site. This was apparently due to the client's wish for an unusually broad stage; and though this is not in a general sense the best way of placing a theatre on the site, in this instance it has had some advantages, a somewhat more picturesque grouping being obtained than would otherwise have been the case. The block is distinctly divided into two parts, one containing the auditorium and stage, and the other the offices, and the architect has contrived to express the purpose of the interior on his façades in a manner which greatly enhances the general appearance of the building.

The exterior is designed in what may be defined as the Spanish Renaissance style, the material being red brick, with terra-cotta of a somewhat lighter tint. The section of the building containing the auditorium is simplicity itself, and its large, plain surfaces are exceedingly effective. The portion of the building which comprises the main entrance, foyers and saloons, is marked by greater elaboration in detail, and is almost entirely in terra-cotta.

The main entrance to the stalls and upper tier leads first into a vestibule, planned so that the way to the different parts of the auditorium can be easily recognised, whilst the saloon is within easy reach, and the box-office well placed in connexion with some managerial rooms. From the vestibule a few steps lead down to the stalls, the staircase taking the visitor to the first tier. The necessary extra exits are symmetrically placed on either side of the auditorium. Not only has the pit its own entrance, but also the second tier, which serves as an amphitheatre and gallery. For the stalls, first tier, pit and second tier, there are symmetrically placed extra exits.

On the same level as the main entrance there is a special saloon for the stalls, which is the most successfully decorated room in the building. The architect has avoided the garishness generally associated with the ordinary theatre bar, and given it a Flemish character, utilising some old carving for panelling the whole of the outer walls to a height of some 7 ft. The bar fittings, furniture, floor, and windows are all in keeping with the period, and a great deal of care has been taken in the details of pottery, pewter-work, and even the hunting trophies which adorn the walls. This sa oon is something unique in this class of building, the only other theatre we know of in which an attempt has been made to obtain a similar effect being the "Flemish" theatre at Brussels.

The first tier is equipped not only with a saloon, but also with a foyer, treated in a modern phase of Italian Renaissance and containing a small fountain.

In respect to the auditorium, both seating and sighting are quite perfect, whilst the general breadth is very effective. There are two tiers, both of considerable depth, and supported by cantilevers at either end. The proscenium, which is surrounded by boxes, shows a plain marble framing. As far as the decoration is concerned, the detail and modelled work are good, but the colouring has certainly suffered from lack of experiments under the ordinary conditions of electrical illumination. In the ceiling, as well as in the upholstery, the effect is hard. This will either require some alteration, or may, perhaps, be toned down naturally in course of time.

The frieze over the proscenium, painted by Mr. Buchell, represents a personification of Britannia, with figures of England and Scotland, and others representing the various arts and sciences. Throughout the remainder of the decorations patriotic emblems have been introduced, the Crown being most in evidence; and a wall-paper in the auditorium, into which the design of a crown is worked, is particularly successful both in design and colouring.

In respect to the offices, there is little to say, excepting that they are thoroughly convenient and equipped in modern style throughout. The stage is notable for its extreme breadth of 140 ft., which will allow of many spectacular effects unobtainable elsewhere. In the construction the only point of interest is to be found in the cantilever work referred to. As regards minor installations, the electric lighting arrangements call for commendation as both economic and practical.

As already mentioned, Mr. Ernest Runtz is the architect. Messrs. Colls & Sons were the contractors, and among the many sub-contractors were Messrs. Dennett & Ingle, who had charge of the constructional ironwork; Messrs. Doulton & Co. for the terra cotta; Messrs. Strode for the electric lighting; and Messrs. Jackson & Son for the modelled decoration.

Considering how generally in this country the designing of theatres has been carried out with mere regard to economy of time and money, and with such commonplace architectural treatment as hardly amounts to design in the true sense of the word, it is gratifying to be able to record and illustrate the erection of a theatre which really possesses original architectural character and is the work of an artist.

DESIGN FOR A COUNTRY HOUSE.

THIS sheet of elevations and plans, which was exhibited at the last Royal Academy, shows a design for a house by Mr. G. C. Horsley, intended to be built in Hampshire. The walls are to be of local stone, and the roofs of stone slates.

We observe that there is no compass point, but it may be presumed that the front towards the terrace faces south or thereabouts, and the entrance north. The gallery between dining-room and drawing-room, with its three bays, is an effective feature in the plan, and rather an unusual one in a house on this scale.

ILLUSTRATIONS OF DEIR-EL-BAHARI.

THESE illustrations are reproduced, with the concurrence of the Egypt Exploration Fund, from some of their photographs and published plates, in order to form illustrations to Mr. Newberry's paper at the Architectural Association, reported in the present issue.

They comprise the general plan of the temple and its immediate surroundings; a view of the exterior of the shrine of Anubis with its proto-Doric columns; two similar columns from the colonnade on the north side of the *temenos*, and a portion of the curious and highly decorative bas-reliefs of trees, on the wall at the back of the colonnade extending across the front of the temple.

DESIGN FOR A PIANOFORTE.

THIS piano shows a decorated treatment of a case which was designed for Messrs. Broadwood, and which has been reproduced by that firm under the name of the "Manxman." One of the particular advantages of this case is its adaptability for decorative treatment. In the design illustrated here the exterior of the piano is carried out in inlaid woods in a scheme of green tones with violet and white. Inside, the colour is in tones of yellow and orange, and the metal work gilded. The flowers are executed in ivory carved in low relief.

M. H. BAILLIE SCOTT.

DESIGN FOR STAINED GLASS.

THESE panels were designed to fill a window in an artist's studio, consisting of five lights. A rich scheme of colouring was adopted, as the window in question was rarely used as a source of light.

Though each panel is a separate composition in itself, the whole window has been taken into consideration in balancing the colour; thus a figure in a blue or green drapery is balanced in the next light by a figure in a warm coloured one; and in the case of the centre figure a neutral tint was chosen to balance the warm and cool colour on each side.

The subjects of the panels are rather varied, and are as follows:—The first, starting from the left, represents "The Goddess of the Winds," or "Air," surrounded by birds; the second represents "Earth," with a background of apples; the third, the Goddess Flora, with roses; the fourth, Undine or "Water," with a background of fishes, seaweed, &c.; and the fifth is another treatment of the Goddess Flora.

LEONARD WALKER.

ARCHITECTURAL SOCIETIES.

MANCHESTER SOCIETY OF ARCHITECTS.—On the 27th ult. a conversazione of the Manchester Society of Architects was held in the City Art Gallery, Mosley-street. All the galleries were thrown open to the visitors, and, in addition, there was an exhibition of architectural drawings and of several exhibits from the recent arts and crafts collection. A large number of ladies and gentlemen accepted the invitations sent out, and they were formally received by Mr. R. J. Bennett, the President of the Society.

THE ELECTRIC LIGHT AT BARNSLEY.—Colonel W. Langton Coke, M.Inst.C.E., an inspector of the Local Government Board, attended at the Town Hall, Barnsley, on the 28th ult., for the purpose of holding an inquiry into an application of the Barnsley Town Council to borrow 25,000*l.* for the purpose of the electric lighting of the town. The Borough Surveyor, Mr J. H. Taylor, said the site of the proposed works adjoined the premises of the Highways and Waterworks Departments. He described in detail the several buildings required for the installation. About half the available site would be at present used, and future extensions would probably be carried across the Highways and Waterworks depôt. The estimated cost of the buildings was 4,678*l.* Mr. Thos. L. Miller, Electrical Engineer to the Corporation, said it was proposed to lay down a plant of 6,000 eight-candle power lamps or their equivalents.

THE ARCHITECTURAL ASSOCIATION.

(Continued from page 407.)

In the middle of the north wall of the Altar Court is the doorway leading to the Funerary Chapel of Thothmes I., a chamber at right angles to the court and measuring 17 ft. 3 in. by 5 ft. 2 in. wide, and roofed with a curved ceiling of elliptical form with horizontal joints. At the north end is a stone seat, and above it is a much mutilated scene. It represented on the left a shrine, in which stood the symbol of the god Anubis, a skin on a pole. Before the shrine stood the Queen, now completely defaced, and behind her Thothmes I., her father, whose cartouche reads "Aa-kheper-ka-ra." In the upper part of the scene were two jackals, also emblems of Anubis, each *couchant* on a shrine. In the centre is the cartouche of the Queen, "Ra-ma-ka," or "Ma ka ra" as it is now read. At the north end of the chapel and on the western side is a niche for the reception of offerings.

In the passage between the southern enclosure wall and the retaining wall of the middle platform, not far from the Hathor shrine, an inclined plane cut in the rock was discovered, leading to the entrance of a large tomb. The rubbish was here quite untouched, and when the doorway was cleared disclosed a large shaft, well cut in the rock, and opening into a larger chamber. In the middle was a square space for a stone sarcophagus, but, instead of the surroundings of an important burial, there was only a poor wooden coffin with bones in it, which seemed to have been disturbed. No inscription or ornament of any kind were to be seen except a few hieratic signs. M. Naville thinks it probable that this tomb was prepared by Hatshepsut for herself, but was never used owing to the hatred of her nephew, Thothmes III.

In this same passage a large foundation deposit was discovered in a rock-cut pit, about 3 ft. deep. It was covered with mats, under which lay first a few pots of common earthenware, then about fifty wooden objects, models of an implement which, for the want of a better name, have been called winnowers. M. Naville says that they may be sledges used for threshing corn. Each bears the cartouche of the Queen. Lower down were fifty wooden hoes, four bronze plaques, a hatchet, a knife, eight wooden models of adzes, and eight larger adzes with bronze blades; at the bottom were ten little pots of alabaster and ten baskets, stands for the pots. All these objects were, as usual, buried in fine sand.

In every Egyptian temple the sanctuary contained a shrine or naos, in which were hidden the emblems of the god to whom the temple was dedicated. They were generally made of wood, so that they could be moved and either placed on sacred boats, or carried by means of staves, as was the ark of the Israelites.

All the wooden shrines have perished, except a very small one, but a foot high, which is now in the Turin Museum. During our first season we found one side of a large ebony shrine, the panel measuring 5 ft. 7 in. high, 3 ft. 7 in. wide, and 1 in. thick; also one leaf of the doors of the shrine, which is 2 ft. 5 in. high, 12½ in. wide, and ⅞ in. thick.

On the inside of the shrine one can see the mortices and part of the adjoining panels. As ebony can only be obtained in small sizes, the whole is pieced together of little bits, and held by pegs of the same wood. The angles or styles are cut out of solid pieces, 2½ in. square, to which are framed the top and two middle rails of the same width as the angles, but only 1 in. thick, thus dividing the whole into three panels. The bas-reliefs represent Thothmes II. making offerings to Amon-Ra, the erasures being probably owing to Akhenaten. Underneath are a series of magical signs, arranged in pairs, and the symbols of stability and duration. At the bottom is a range of the so-called false or "Ka" doors.

Externally the panel is divided into six divisions, two of the rails being only thin pieces of ebony pegged on, forming what we should term a sham. Rows of the same emblems are arranged in the panels, and the styles or rails are beautifully carved with dedicatory inscriptions of Thothmes II., part of which reads: "He made a sacred shrine of great value of ebony of the mountaineers (of Nubia)." On each of the horizontal lines it is stated that Thothmes is a worshipper of Amon-Ra, who dwells in "Serui," the ancient name of the temple.

The small leaf of the double door is also made of irregular-shaped pieces of ebony, dowelled together, and having eleven small ledges pegged on to one side, each of them about ⅛ in. by ⅜ in. and rounded on the back. The pivot side of the door is also rounded and the bolt side rebated for the other leaf. Four bronze staples for the bolts are still in position.

A description of this temple, however slight, would be incomplete without a reference to its celebrated architect, Senmut. It seems that though Hatshepsut, like Queen Elizabeth, was not beloved of her relations, yet she had the same power of drawing to herself great men. Of such a man, Senmut, the architect of her temple, we have many records. To quote the *Edinburgh Review*, "The many sidedness of Michelangelo was nothing compared to that of Senmut—the queen's architect—who himself superintended the quarrying and carving of the queen's obelisks, was tutor to the queen's daughter Neferura; he was keeper of the temple of Amon; keeper of the granaries of Amon; royal seal-bearer; keeper of the palace; keeper of the heart of the queen (to which title Petrie compares keeper of the king's conscience or Lord Chancellor), priest of Aahmes; keeper of the queen's cattle." Besides his great work at Deir-el-Bahari, he directed the erection of Hatshepsut's two granite obelisks at Karnak and superintended architectural work at the temples of Karnak, Mut, Luxor, and Erment. A kneeling statue of him was discovered by Miss Benson in 1896 at her excavations at the temple of Mut. The inscription states that it was "presented by favour of the queen," and some further interesting particulars of his life will shortly appear in her book on this temple.

My brother had the good fortune to discover his tomb high up on the north-east of the Gournah hills. It had been very magnificent, bnt the painted facing of the walls is now almost entirely destroyed.

A clear white glass bead, inscribed Senmut, was found at Deir-el-Bahari, as well as a fragment of a statue of him. My brother has a carefully-worked piece of black marble inscribed with his name, which appears to have been a paint muller, and may have been used by him for mixing up his Indian ink.

It is recorded that he was a man of the people, for "his ancestors were not found in writing," and his portrait-statue gives no very high-bred features, but an ugly, capable, complacent face.

In conclusion, I must acknowledge my indebtedness to the various publications of the Egypt Exploration Fund, by M. Naville, which I would refer you to for further information on this interesting and beautiful temple; also to Professor Flinders Petrie's "History of Egypt," and Professor Steindorf's edition of Baedeker's "Guide to Egypt," 1898.

The Chairman said they must all feel indebted to Mr. Newberry for a lecture which was particularly interesting at the present time. The lantern views and the lecturer's descriptions brought the places very vividly before them. The photographs were excellent, and in looking at the views one could almost feel the hot sun which they knew bore down upon the ruins. It was very interesting to an architect to study among such ruins, but one could not help feeling some regret that there was still a possibility of the debris from the cliffs accumulating so that the work of the ancient builders would be destroyed and the labour of the present excavators wasted. It was a matter for satisfaction that the work of those men was being discovered, and to know that the remains of their work was handing down the history of the periods in which they lived. Even in those days the architect, judging from Mr. Newberry's description, was a man appreciated by those in power; his work was appreciated for the sake of the work, and he passed on to future times memorials such as few countries had equalled in massiveness and strength of construction.

Mr. R. Phené Spiers, in proposing a vote of thanks to the lecturer, said he had been looking forward with considerable interest to the lecture, because no less than thirty-two years had passed since he stood on the plains of Thebes, and he was curious to see how far his recollection would take him, and whether he would be able to recognise the objects Mr. Newberry had put before them. The excavations which had been made at the Temple at Deir-el-Bahari, in clearing away all the rubbish that had accumulated, had exposed to view the whole disposition of the building, and there was no doubt that they owed a great debt of gratitude to the Egypt Exploration Fund, to M. Naville, and to Mr. Newberry (who had measured the work), for the preservation of the remains. There was one point, however, where he should have to traverse the statement of Mr. Newberry. He (the speaker) had not the slightest doubt that since he visited the place in 1866 earth and sand had blown over a great portion of the work, so that when excavations were made at the time Mr. Newberry referred to (in 1893), there were a series of mounds covering the work that he had seen in 1866. It was only in that way that he was able to explain the matter, for it was all very well to say that the temple was buried 30 or 40 ft., but he had plans which showed that he saw it thirty years ago. Mr. Newberry had referred to the earlier descriptions as given in the account of the French expedition of 1798, and later on in the works of Wilkinson, Lepsius, and Mariette, the latter of whom undertook important excavations in 1858, and published a monograph on the temple. That monograph was not published until 1877. Mr. Newberry had also said: "But it was reserved for the Egypt Exploration Fund, under the able guidance of M. Naville, to bring to light one of the most interesting temples of Egypt, of which up to 1893 two-thirds were covered by mounds of rubbish that reached to a height of 40 ft. in places." Well, he (the speaker) saw through that 40 ft., as did his friend, Professor Brune. In proof of that statement he was able to exhibit that evening plans made at the time of his visit. Mr. Newberry had evidently not read Mariette's work; had he done so, he would have seen but a slight mention of the name of the discoverer of the Temple; and had he looked at Perrot and Chipiez's work, he would have noted that the name of the man who really discovered the Temple was Emmanuel Brune, a Grand Prix man, who measured, with some slight assistance from himself, the whole of the Temple, and made some astonishing drawings for the Institut of France in 1867. When Mariette saw those plans, he asked the author to lend them to him, and subsequently published them, forgetting, however, to acknowledge his indebtedness to Brune. Mariette, not being an architect, did not claim the restoration of the Temple, and he was obliged to give Brune the credit of that. That was not the only action of Mariette to which he took exception. Professor Brune also lent Mariette the plans of Karnak, who published them in 1878, without Brune's name attached. As to M. Naville, of course, he had been able to make a few discoveries of his own, and the chief credit in the matter pertaining to him was his discovery of the bas-reliefs, which, owing to his Egyptian knowledge, he had been able to read. As regarded the general plan, he would read an extract from Perrot and Chipiez's "History of Art in Ancient Egypt." The authors said: "We must refer those who wish to study the remains of this temple in detail to the work devoted to it by M. Mariette. The plan which forms plate 1 in the said work was drawn in 1866 by an architect, M. Brune, who is now a professor at the Ecole des Beaux-Arts. M. Brune succeeded, by intelligent and conscientious examination of all the remains, in obtaining the materials for a restoration *which gave us for the first time* some idea of what this interesting monument must have been in the great days of Egypt. Plate 2 contains a restored plan; plate 3 a view in perspective of the three highest terraces out of the hill which forms their support. We have attempted to give an idea of the building as a whole. Our view is taken from a more distant point than that of M. Brune, but, except in some of the less important details, it does not greatly differ from his." He could not help thinking that it seemed a little unfair, therefore, for M. Naville to say in the preface of his book on "Deir-el-Bahari" that "little was known before the excavations of 1893, for not even Mariette had made any attempt to explore this part of the ruins, and in the conjectural restoration made for him by M. Brune the northern half of the upper platform is represented as symmetrical with the southern." As he had previously stated, the "conjectural restoration" was made by Brune for the Institut of France and not for Mariette. Professor Brune, who was dead, was one of the most remarkable men of his time, and he (the speaker) felt bound, as his friend and companion, to take up his case, the more so as M. Naville remarked to him (the speaker) on the only occasion they had ever met that Professor Brune did not discover anything at all. Mr.

Newberry had referred to the small wages paid to the labourers at Deir-el-Bahari. Mr. Somers Clarke, who had spent some time in Egypt and had built a house there, paid for sunburnt bricks of the same dimensions as those mentioned by Mr. Newberry, viz.: 12 in. by 6 in. by 4½ in.—7d. per thousand, The house cost Mr. Somers Clarke something like 17*l.* or 18*l.*, and had two vaulted halls—one barrel vaulted and the other with a dome. The barrel vault was built in the same way as in the granaries of Rameses, and the dome was constructed without centering. They must all be much obliged to Mr. Newberry for his valuable lecture and for the illustrations which he had shown them that evening.

Mr. Alex. Payne, in seconding the vote of thanks, said he was at the Temple of Deir-el-Bahari last year, and from the early views shown that evening he was able to appreciate how impossible it had been to form a clear idea of the Temple until the works which Mr. Newberry had referred to had been carried out. There was nothing in Rome or Athens to compare with the extensive remains at ancient Thebes, and he would recommend all who could possibly do so to visit the place. The Temple of Deir-el-Bahari was different from other temples to be seen in Egypt; in most temples in Egypt there were two or three large halls: there was a large court in front, to which the people were admitted, a second court to which princes and important people were admitted, and then the cella, where the statuary was kept, with other rooms for service around; but at Deir-el-Bahari there was a different arrangement. He was not sure whether it should be regarded as a temple at all, for it was a sort of cemetery, or mortuary, building. Most of the religious buildings on the west bank of the river at Thebes were mortuary temples built in honour of the ancestors of the Pharoahs who erected them.

Mr. C. H. Brodie asked the lecturer where the great quantity of rubbish came from? Was it principally sand, which had been blown over the temple? It was remarkable that the architect was so much appreciated in those days. He had read somewhere that an architect was the only person not of royal blood who was permitted, in those days, to marry a princess. Could Mr. Newberry verify that statement?

Mr. Alex. Wood asked the lecturer whether he knew how the buildings at Thebes compared constructively with those at Memphis? He was reading some time since that there was a difference in the workmanship to the disadvantage of the buildings at Thebes.

The Chairman, in putting the vote of thanks, said the remarks made by Mr. Spiers had been extremely interesting; it was important in the interests of truth to know who was the real discoverer of the Temple.

The vote of thanks having been agreed to,

Mr. Newberry, in reply, said that in regard to the accumulation of material from the falling cliffs, the "gafirs," or native custodians of the ancient monuments, appointed by the Egyptian Government, would clear away the débris as it fell. Mr. Spiers' remarks were extremely interesting; but he (the speaker) had purposely not dealt with the restoration, but only with actual facts relating to the Temple. He was sorry that Mr. Spiers appeared to think that M. Naville claimed to be the discoverer of the Temple. He did not think that M. Naville could have made such a claim, because when he (the speaker) first went to Deir-el-Bahari, the greater part of the architectural details of the southern side of the Temple were already exposed to view, and the Hypostile Hall was accessible, though one could only just creep in between the architrave and the rubbish. Brune's restoration was extremely interesting, and was mentioned by M. Naville in his Introductory Memoir on the Temple, in which Mariette's plan was also published. The latter was wonderful as far as it went, though it was not quite accurate. For instance, in the middle colonnade, Mariette, or rather Brune, showed twenty columns on either side, whereas there were really twenty-two.

Mr. Spiers: There are twenty-two in the original sketch and in Brune's restoration. A mistake has been made in copying from the original plan.

Mr. Newberry, continuing, said that Mr. Spiers' remarks about the construction and price of Mr. Somers Clarke's house were very interesting. It was surprising that Mr. Clarke was able to get his house built for so small a sum. The house he had referred to in his paper had cost nearly 100*l.*, but then it was much larger and some of the extra cost of that was due to the fact that the site was about three miles from the Nile, and all the water they wanted had to be conveyed on donkey back; they had also to burn their lime on the spot. He agreed with Mr. Payne, that the monuments on the west bank of the Nile were almost entirely of a funerary character. To return to the rubbish question, a great deal of what had to be cleared away consisted of the débris left by the original builders, as well as the rubbish which Mariette had moved from the south to the north side of the Temple. No doubt large quantities had also fallen from the friable cliffs. The almost tropical sun heated the limestone rocks to such a pitch during the day that the sudden chill at sunset sometimes caused pieces to fall off with the noise of an explosion. As to Mr. Wood's question, there were no temples left in the earlier capital of Memphis, but there was no doubt that the earliest work was also the most artistic. The nearest to life of any statue that had come down to us from Egyptian antiquity was the celebrated "Sheikh el Beled"—a wooden statue—of the Vth dynasty from Sakkarah—now preserved in the Gizeh Museum, and of which there was a cast in the British Museum.

On the motion of the Chairman a vote of thanks was accorded to the Palestine Exploration Fund for the loan of diagrams.

The Chairman announced that the next meeting would be held on November 11, when Mr. H. Wilson would read a paper on "Arts and Crafts."

The meeting then terminated.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of this Council was held on Tuesday in the County Hall, Spring Gardens, Mr. McKinnon Wood, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee, it was agreed to lend the Newington Vestry 10,000*l.* for electric lighting purposes; the Shoreditch Vestry 10,470*l.* for the same purpose; the Wandsworth Burial Board 3,000*l.* for the extension of Wandsworth Cemetery; the Whitechapel Guardians 29,000*l.* for the purchase of land and buildings adjoining the infirmary; and the London School Board 150,000*l.* for new schools.

The Water Question.—The whole of the sitting was occupied in the discussion of the following proposals of the Water Committee:—

1. That a Bill be promoted in the coming Session of Parliament for the purchase, by the Council, of the undertakings of the eight metropolitan water companies, by agreement, or failing agreement, by compulsion.

2. That, subject to such provision as may be made by Parliament as to the ultimate Authority or Authorities, provision be made for the undertakings of the companies vesting in the Council at a date not later than six months after the passing of the Act.

3. That the Bill contain provisions authorising the Council to proceed forthwith with the connecting and laying of mains and other works necessary in order to enable it to protect any part of the metropolis from want of water.

4. That the arbitration clause be so framed as to render it certain that in the case of each company the arbitrator will have regard to all such circumstances as may be brought before him, and that no allowance shall be made in respect of compulsory sale except for cost of reinvestment (if any).

5. That, subject to further negotiation thereon with the Local Authorities, the clauses with respect to the supply of outside areas should follow the principle of the bills promoted by the Council in 1895.

6. That the understanding with the Corporation of the City of London, with regard to their representation on the Water Committee, be adhered to if they so desire.

7. That a Bill (or Bills) be promoted in the coming session of Parliament for the purpose of empowering the Council to bring an additional supply of water to London from the watersheds of the Wye and Towy on the general lines of the report of the Water Committee approved by the Council, April 21, 1896, in so far as it applies to the Wye section of the Engineer's scheme.

8. That it be referred to the Parliamentary Committee to prepare and present to the Council the necessary Bills for carrying out the above resolutions.

The recommendations were all agreed to, most of the proposals being supported by both parties in the Council.

Abbey Mills and Isle of Dogs Pumping Stations: Repainting.—The Main Drainage Committee recommended, and it was agreed—(*a*) That the tender of Mr. Arthur H. Inns, amounting to 2,154*l.* 9s. 4d., for the repainting of the Abbey Mills and Isle of Dogs pumping stations, be accepted; that the solicitor be instructed to prepare the contract; and that the seal of the Council be affixed to the contract, when ready. (*b*) That Mr. J. Berry be employed as clerk of works to supervise the repainting above referred to, at the wages of 3*l.* 3s. a week.

Sanitary Condition of St. Pancras.—The report of the Public Health Committee contained the following paragraphs:—

"We present, for the information of the Council, a report by the Medical Officer, to which is appended a report by Dr. Hamer on the result of his recent inquiry into the sanitary condition and administration of the parish of St. Pancras. The circumstances which led to the inquiry were as follows:—Early in this year Dr. Sykes, the Medical Officer of Health of St. Pancras, submitted a report to his Vestry in which he showed that, in respect of the number of sanitary inspectors employed, the parish compared unfavourably with other large districts in London. The Health Committee of the Vestry thereupon recommended that two additional sanitary inspectors and an additional clerk should be appointed for a period of twelve months; but the Vestry declined to adopt the recommendation. Dr. Hamer, in a previous report on the question of the regulation of houses let in lodgings, had already pointed out that adequate supervision could not be exercised over tenement houses in this parish unless the existing staff was strengthened for this purpose, and this report had been communicated to the Vestry before they resolved not to adopt their own Committee's recommendation. In these circumstances we thought it well that Dr. Hamer should make inquiry in the parish, with a view to determining its needs in the matter of sanitary inspection. Dr. Hamer's present report shows that St. Pancras contains a larger number of persons living in tenements of one and two rooms than any other London sanitary district. He compares the results of his inspection of the district with those obtained by similar inspection in Mile End Old Town, Whitechapel, and Lambeth, and points to the unfavourable position of St. Pancras with respect to the number of dirty, dilapidated, and overcrowded houses. Dr. Hamer lays stress upon the need of maintaining a proper standard of house accommodation, and as a means towards that end, of the regulation of the poorer houses let in lodgings. He found in St. Pancras, as he has found elsewhere, that houses in which dirty and dilapidated conditions and overcrowding especially existed occurred in groups, and were evidently associated with particular ownerships. Such houses need supervision much in the same way as common lodging-houses, and with the existing staff of sanitary inspectors it has been found impossible to undertake this duty. For the purpose of maintaining the district in proper sanitary condition, he recommends the appointment of seven additional sanitary inspectors with the necessary clerical staff, and this recommendation is endorsed by the Medical Officer. We have forwarded copies of Dr. Hamer's report to the Vestry, with a request for their observations upon it, and propose to report further to the Council after these have been received. In the meantime, we have given instructions for copies of the report to be circulated among the members of the Council, and placed on sale."

Reidhaven-road District, Plumstead.

"On May 3 last, we submitted to the Council a report by Dr. Hamer on the result of his inspection of the Reidhaven-road district, Plumstead, and we stated that we would again bring the matter before the Council after we had received the observations of the Vestry upon the report. These were submitted in a printed statement forwarded by the Vestry to each member of the Council, and the Vestry have since decided with regard to this district—(*a*) To increase the strength of the sanitary staff by the appointment of an additional sanitary inspector in place of the food and drugs inspector, a portion only of whose time was given to the work of Plumstead. (*b*) To register all houses which are occupied by members of more than one family, and at which conditions of dirt and dilapidation are known to exists. (*c*) To require all defective drains to be re-laid. (*d*) To apply the water test to all new drains, and where considered by the Surveyor to be practicable to relay drains. (*e*) To apply the water test to all drains constructed by the Vestry, on the same conditions as in the case of private drains. (*f*) To gather information from other parishes as to the practicability of the water test in all cases, especially where gradients are steep. (*g*) To require all defective sites to be concreted, and, where necessary, damp courses to be laid. (*h*) To require the removal of all defective closet-pans, and new closet-pans to be fixed in accordance with the London County Council's by-laws. In these circumstances we do

not propose to take any further steps in the matter at the present time, and we report our action for the information of the Council."

District Surveyor for North Battersea.—The Building Act Committee reported as follows, the recommendations being agreed to :—

"The Council on November 10, 1897, consented to the appointment by Mr. H. J. Hansom, District Surveyor of North Battersea, of Mr. J. A. J. Woodward to act for one year as Deputy District Surveyor for the district, the state of Mr. Hansom's health being such as prevented his carrying out his duties efficiently. Mr. Hansom has asked to be allowed to resume duty as District Surveyor at the expiration of the period named, or that Mr. Woodward may be reappointed as his deputy. The Section (142) of the London Building Act, 1894, which permits of the arrangement, provides that 'if any district surveyor is prevented by illness, infirmity, or any other unavoidable circumstance from attending to the duties of his office, he may, with the consent of the Council, appoint some other person as his deputy to peform all his duties for such time as he may be prevented from executing them." We are of opinion that, in the public interest, it is advisable that the arrangement sanctioned by the Council should be continued for another year, and recommend—That the consent of the Council be given to Mr. H. J. Hansom, the District Surveyor under the London Building Act, 1894, for the district of North Battersea, appointing as his deputy, Mr. J. A. J. Woodward, of No. 69, Kennington Oval, to perform all the duties of such District Surveyor for the period of one year from November 10, 1898 ; such consent being subject to the condition that Mr. Hansom shall not during the said period, without the previous consent of the Council, to be signified in writing under the hand of the Clerk of the Council, act as district surveyor,or revoke the appointment of Mr. Woodward as such deputy, or in any way interfere with the performance by Mr. Woodward of his said duties."

Reprinting of London Building Act, 1894, with Amendment Act, 1898 :—

"The London Building Act, 1894, Amendment Act, 1898, having now become law, we think it would be for the convenience of the public if the Council's edition of the London Building Act, 1894, together with the regulations of the Council as to applications for consent or sanction under the Act and the by-laws now in force relative to buildings, were reprinted and issued, with the Amendment Act, in book form. This would form a complete code with reference to the control of building operations in London. The cost of 2,000 copies bound in cloth is estimated at 76*l.* 13s., and we think that the copies should, as on the previous occasion, be placed on sale at the price of 3s. each. We recommend that the London Building Act, 1894, with the Amendment Act, 1898, the regulations of the Council as to applications for sanction or consent under the Act, and the by-laws now in force relative to buildings, be printed together in book form, at an estimated cost of 76*l.* 13s. for 2,000 copies, and be placed on sale at the price of 3s. each copy."

The Architect's Department.—The Establishment's Committee recommended, and it was agreed (*a*) That a retiring allowance of 316*l.* 13s. 4d. per annum, being thirty-eight sixtieths of his present salary of 500*l.*, be granted to Mr. C. W. White, Chief Clerk of the Architect's Department, as from December 31, 1898, and that up to and including that date his salary be continued to be paid at the rate of 500*l.* a year. (*b*) That as from and including January 1, 1899, Mr. Lancaster be styled Chief Clerk of the Architect's Department. (*c*) That authority be given for the appointment, on the retirement of Mr. White, of a fourth-class clerk in the Architect's Department."

Proposed New Street (and Streets in Connexion therewith) from Holborn to the Strand; and Widening of Southampton-row.—The Highways Committee reported as follows, the recommendation being agreed to :—

"The Council, on July 5 last, on the recommendation of the Improvements Committee, referred it to us to consider and report upon the question of powers being sought to enable the Council to lay tramways (*a*) along the proposed new street from Holborn to the Strand, and the new streets to be formed in connexion therewith ; and (*b*) along Southampton-row to connect with the existing tramways in Theobald's-road. With reference to this matter, we would point out that there will be ample time during the construction of the new streets and the widening referred to, for the Council to apply for powers to construct tramways along them if it should so decide ; and, moreover, the whole question of the construction of new tramways in London will shortly be considered by us, with the assistance of the chief officer of tramways about to be appointed, and we shall be in a better position later on to advise the Council on the subject of the reference. We have therefore come to the conclusion that it would not be advisable for the Council to seek any powers in the Improvements Bill of next session for the construction of tramways in the streets referred to therein ; and we recommend—That, in the Improvements Bill to be promoted by the Council next session, no provision be made for the construction of tramways in the streets referred to in the Bill ; and that the Parliamentary Committee be instructed accordingly."

The Council adjourned at half-past seven o'clock.

ARCHÆOLOGICAL SOCIETIES.

NEWCASTLE SOCIETY OF ANTIQUARIES.—A monthly meeting of members of the Newcastle Society of Antiquaries was held on the 26th ult., in the library of the Castle, Newcastle, Mr. Cadwallader J. Bates (one of the vice-presidents) in the chair. Mr. R. C. Bosanquet read an interim report on the excavations of 1898 at Housesteads, in the course of which he said he hoped that in a short time arrangements might be made for the exhibition of the number of interesting objects found in the course of the work. He thanked the members of the Society and others who had aided him by their counsel throughout the operations. Both universities had aided, not only with money, but also men. He should like to state how much the success of the excavation was due to Mr. Thomas Smith, their late foreman, who took as genuine an interest in the work as any member, and also to Mr. J. Nicholson, who succeeded him.—Mr. Knowles, after describing a building which had been revealed, and of which he had made a drawing, referred to the efficient way in which Mr. Bosanquet had carried out the work. Mr. Bosanquet had taken up his residence on the spot, and had been continuous in his services. He had devoted the whole of his time to the work, had kept a most careful log book, and would be able to give them a voluminous report. Mr. S. S. Carr read "Notes on the Heraldic Glass in Earsdon Church," and Mr. W. W. Tomlinson read "Notes on Jesmond and North Gosforth Chapels, Salter's Bridge, Gosforth, and Burradon Tower," for which both were thanked.

ENGINEERING SOCIETIES.

THE INSTITUTION OF CIVIL ENGINEERS.—The eightieth session of this Institution was inaugurated on Tuesday evening by an address from the President, Mr. W. H. Preece, C.B., F.R.S., who assumed the chair for the first time after his election. After referring to the position occupied by the Institution as the representative of engineering science in this country the President touched upon the question of technical education, his opinion being that the commercial supremacy of the country was threatened by the operation of causes other than deficiency in technical education. These were the superior commercial skill of principals at home and the accomplished polyglot and well-trained traveller abroad, as well as the existence of a commercial system more moral and sound than that seen in England at the present time. In Germany, the generous and enlightened policy of banks allowed of financial support being readily given to a new industry designed by some simple, well-devised and economical process, whereas in England it required a syndicate, a pioneer company, and finally an appeal to the public for an enlarged limited company. The financiers, the lawyers, the brokers, as well as the original inventor, had to be satisfied, and this satisfaction grew very much with the state of the money market and the excitement for investment manifested by the public. Thus, though new industries were established, they had to contend with terribly overloaded capital, overloaded by the harpies who had sprung from the operations of the Limited Liability Act. The more technical subject-matter of the address was directed to the growing importance of electricity in regard to the affairs of daily life. Beginning with Faraday's doctrine, which regarded electricity as the result of the play of atoms and molecules of matter, the President traced the development of those ideas as realised in telegraphy, telephony, electric lighting, heating and traction, the transmission of power, and in the various processes included in the term electrochemistry. A result of the utilisation of electric energy would be the revival of many home industries, to the great advantage of the working classes, whose time was wasted in long excursions to the factory, and whose health, morals, and well-being were not improved by herding in great numbers, and by incessant association with the grievance-monger and the professional agitator. These considerations led the President to point out that electrical work was fast ceasing to be a speciality, and to prophesy that every engineer must ultimately become an electrician ; and he deemed the time not far distant when electricity would be the most general, the most useful, and the most interesting form in which the fundamental principles of energy would be applied to the benefit of mankind.

APPLICATIONS UNDER THE 1894 LONDON BUILDING ACT.

AT the meeting of the London County Council on Tuesday, the Building Act Committee brought up the following list of applications under the London Building Act, 1894. Those applications to which consent has been given are granted on certain conditions.*

Lines of Frontage.

Clapham.—A wood and glass porch in front of Westview, Thurleigh-road, Balham (Mr. E. U. Story).—Consent.

Islington, North.—A two-story addition at the rear of 681, Holloway-road, to abut on Windermere-road, Islington (Mr. J. W. Stevens for Messrs. Knowlman Brothers).—Consent.

Lewisham.—Twelve three-story houses with shops on the ground floor on the north-east side of Springbank-road, Hither Green. (Mr. A. C. Baker for Messrs. Osborne, Son, & Company).—Consent.

Newington, West.—A building on the southern side of Manor-place, Walworth, adjoining the Coroner's court. (Mr. R. Plumbe for the Vestry of Newington).—Consent.

Westminster.—That the application of Mr. C. Fruen for an extension of the period within which the erection of one-story shops on the forecourts of Nos. 96, 96A, 96B, 98, 100, 102, 104, 106, 108, 110, 112, 114, 116, 118, 120, and 122, Victoria-street, was required to be commenced, be granted, upon condition that the shops referred to be commenced within twelve months from March 29, 1898.—Agreed.

St. George, Hanover-square.—An iron and glass pent at the entrance to No. 24, Park-lane, to abut upon Great Stanhope-street (Messrs. Starkie Gardner, & Company, for Sir E. Sassoon).—Refused.

Kensington, South.—That Messrs. Turner & Co. be informed, in reply to their letter on behalf of Mr. Crowle, requesting permission to substitute a semi-circular roof for the pitch roof shown upon the plans approved by the Council on July 19, 1898, for the erection of an iron and glass covered way at the principal entrance to the De Vere Hotel, Hyde Park-gate, that the Council considers it inexpedient to sanction any departure from the plans referred to.—Agreed.

Rotherhithe.—A church on the west side of Southwark Park-road, Bermondsey (Mr. J. C. T. Murray for the Building Committee of the Bermondsey Presbyterian Church).—Refused.

Hackney, South.—One-story shops upon part of the forecourts of Nos. 140, 142, 144, and 146, High-street, Homerton (Messrs. J. Garey & Son for Messrs. Stevens & Son).—Refused.

Peckham.—A one-story addition in front of the Brewery, Hill-street, Peckham (Mr. B. Tabberer for Messrs. E. & J. Brooks).—Refused.

St. Pancras, West.—An iron and glass covered way at the entrance to the Bedford Music-hall, High-street, Camden Town (Mr. B. Crewe for Messrs. Lucas & Johnson).—Refused.

Strand.—That Messrs. Eastman & Company be informed that the Council is not prepared to accede to their request for the Council's consent to retain the wood and glass show-cases erected in front of Nos. 171 and 173, Regent-street, as shown upon the plan forwarded with the applicants' letter in reply to a penal notice served upon them.—Agreed.

Westminster (detached).†—Two oriel windows to buildings proposed to be erected on the site of Nos. 19, 20, and 21, High-road, Knightsbridge (Mr. C. W. Stephens for Mr. J. C. Humphreys).—Refused.

Width of Way.

Camberwell, North.—Four houses on the east side of Pitman-street, between Nos. 21 and 27, (Mr. A. Barsht).—Consent.

Hammersmith.—An addition to No. 180, King-street West, to abut upon Dalling-road, Hammersmith (Mr. G. Trotman for Messrs. Selden & Son).—Consent.

Open Space about Buildings.

Bethnal Green, South-West.—A building with a one-story shop in front on lot 14 of the Council's land, on the east side of Ainsworth-street, at the corner of Church-street, Bethnal Green, with an open space at the rear (Mr. C. R. Peters).—Consent.

Whitechapel.—A dwelling-house with a factory and office on the ground-floor on the site of No. 19, Church-lane, Commercial-road, with an open space at the rear (Mr. A. C. Payne for Mr. J. King).—Consent.

* Names of applicants are given in brackets. Buildings are new erections unless otherwise stated.

Line of Fronts and Width of Way.

Fulham.—A two-story addition on the northern side of No. 4, Filmer-road, Fulham (Mr. R. Burr for Dr. Ivor Davis).—Consent.

Fulham.—†Shops and residential flats on the north side of Dawes-road, between Werley-avenue and Estcourt-road, and the proposed position of certain other buildings to abut upon a passage way leading to Pellant-road and Protheroe-road (Mr. D. Matthews for Mr. F. Batty).—Refused.

Line of Fronts and Construction of Buildings.

Rotherhithe.—A steel gangway across Battle-bridge-lane, Tooley-street, Southwark, at the fourth floor levels of warehouses in connection with Hay's wharf (Mr. E. A. B. Crockett for the proprietors of Hay's wharf).—Consent.

Width of Way and Temporary Buildings.

City of London.—Two iron buildings on a site on the north side of Paul's-alley to abut upon Jacob's well-passage (Mr. T. J. Anderson for Mr. W. O. Aves).—Refused.

Formation of Street.

Fulham.—That an order be issued to Mr. F Matcham refusing to sanction the formation or laying-out, for foot traffic only, of a new street to lead out of the east side of Harwood-road into Cedar-road, Walham-green (for Sir J. H. Johnson).—Agreed.

Means of Escape at Top of High Buildings.

St. George, Hanover-square.—That Mr. G. D. Martin be informed that the Council is prepared to grant a certificate in respect of the means of escape in case of fire to be provided for the persons dwelling or employed on the fifth and sixth floors of the Premier Hotel, Nos. 47 and 48, Dover-street, Piccadilly (for Mr. W. G. Hornsey).—Agreed.

Strand.—That Mr. W. Emden be informed that the Council is prepared to grant a certificate in respect of the means of escape in case of fire to be provided for the persons dwelling or employed on the fifth and sixth floors of the Hotel de l'Europe, Leicester-square, at the corner of Leicester-place (for Mr. R. Baker).—Agreed.

Buildings for the Supply of Electricity.

Chelsea.—That the Council do approve of a deviation from the plan, deposited with the application of Mr. A. Roberts, for the Chelsea Electricity Supply Company, Limited, for the construction of a generating station on the west side of Flood-street, at the corner of Alpha-place, Chelsea.—Agreed.

Recommendations marked † are contrary to the views of the Local Authority.

THE LONDON BUILDING ACT, 1894:

TRIBUNAL OF APPEAL CASE.

THE Tribunal of Appeal under the London Building Act, 1894, sat in the Arbitration Room of the Surveyors' Institution on Friday, the 28th ult., to hear an appeal by Messrs. H. E. & W. Bury, solicitors, on behalf of Messrs. H. W. Hill, against the decision of the London County Council not to sanction certain deviations from the plan certified by the District Surveyor (Mr. T. W. Watson) under Section 43 of the Act, so far as relates to the proposed rebuilding of Nos. 5 and 6, Stanbrook-court, Old Bond-street, St. George's Hanover-square, as shown upon the plans submitted with the application to the Council. The members of the Tribunal sitting were Messrs. Arthur Cates (Chairman), A. A. Hudson, and Penfold.

Mr. Macmorran, Q.C. (instructed by Messrs. H. E. & W. Bury), appeared for the appellants, and the Council was represented by Mr. Seager Berry, from the Building Act Department.

Mr. Macmorran, in opening, said the Tribunal would not be asked to decide any question relating to the construction of the statute, but whether the deviations referred to were such as came within the section, and whether the circumstances were such as to render the further consent of the Council necessary. The history of the transactions between the appellants and the Council dated from May 5, 1897, when Messrs. Hill received from that Authority a notice under the Factory and Workshops Act requiring them to provide for their workshops means of escape from fire. Upon that the appellants consulted Mr. F. E. Eiloart, an architect, who, on his part, entered into negotiations with the officials of the Council, and submitted various suggestions for meeting the requirements of the Act. Certain difficulties, however, presented themselves, and Messrs. Hill were advised that the only way by which they could carry out the terms of the notice was to acquire the premises at the rear of their existing shops—namely, those in Stanbrook-court. Over 40,000*l.* was spent in thus acquiring the additional premises. Thereupon considerable correspondence ensued between Mr. Eiloart and the County Council authorities, and at length approval was given to plans submitted. In March, however, when the building in course of erection on the site had been raised to the height of the old building the District Surveyor intervened on the ground that the building, if continued, would show deviations from the original plans, and intimated that it would be necessary to get the Council's further sanction to the plans under the London Building Act. It came as a surprise to his (counsel's) clients that it was necessary, in complying with the Building Act, to obtain sanction beyond that given in the first instance under the Factory Acts. The District Surveyor served notice of irregularity, upon which a summons was issued against Messrs. Hill, and was heard by Mr. De Rutzen at Marlborough-street Police-court on June 21. The Magistrate, after hearing the facts, suggested that a formal application should be made to the Council under the London Building Acts, and the case was adjourned *sine die*. Application was accordingly made to the Council by a letter written by the appellants. He should have thought that the letter under these circumstances would have been regular, but the only reply they received was that the Council refused to consent to the deviations under Section 43 of the London Building Act. They gave no reasons for that refusal; therefore, Messrs. Hill had no alternative but to come before the Tribunal of Appeal. His clients considered that they, after paying an immense sum to comply with the Factory and Workshops Act, had been subjected to great hardship not to say injustice by the refusal of the Council to sanction the plans. The position of the appellants was clearly set out in a letter from Mr. H. W. Hill to the Council on July 15, in which he stated:—"In the course of the correspondence which passed between me and the Superintendent Architect of the Council and more particularly by the letter dated October 9, enclosing plan of the proposed alterations, I made it clear that the premises in Stanbrook-court, which would have to be pulled down and rebuilt for the purpose of complying with the notice, would be rebuilt to a greater height than the original building. Upon receiving the approval of the Council contracts were entered into for the carrying out of the works, and the works proceeded. I was not aware, nor was my architect, that any further approval or sanction of the Council would be required, and it was with some surprise that on May 28, 1898, my builders received from the District Surveyor a notice of irregularity, to the effect that in rebuilding the premises in Stanbrook-court I had contravened Section 43 of the London Building Act in that I had deviated from the plan certified by the District Surveyor under the said Section of the domestic building existing on the site at the passing of the said Act, and without having obtained the sanction of the London County Council or of the Tribunal of Appeal to such deviations. At the date of receiving this notice the building was more than halfway built. My present application to the Council is that, under the circumstances, they should sanction the erection of the new building as shown in my plans, or in so far as the works approved by the Council for the purpose of complying with the notice under the Factory Acts may be a deviation from the certified plans within the meaning of the said Section."

Mr. Frederick E. Eiloart, architect, of 40, Chancery-lane, W.C., gave evidence in support of the appeal, and was cross-examined at considerable length by Mr. Seager Berry.

In the result the Tribunal allowed the appeal, the Chairman stating that in coming to that decision they had considered all the circumstances.

Correspondence.

To the Editor of THE BUILDER.

GODALMING TOWN HALL COMPETITION.

SIR,—With reference to your notes on the Godalming Competition for Municipal Buildings, you mention that the plan selected complies with the spirit but not with the letter of the instruction.

As one of the competitors, I am inclined to think that the majority of them will not regard this matter as quite such a trifle as you appear to suggest.

Possibly you are not aware that the Instructions distinctly required the following, viz.:—

1. That there should be a 10-ft. way left open along the south side of the public hall.

2. That this way was to be left as indicated on the block plan supplied, in which the 10-ft. way was coloured yellow.

3. That the instructions allowed of building in this position only on the first floor.

4. That in answer to a question as to whether the 15-ft. back road may not be used for the engines instead of the passage "through centre of site," as suggested, the reply printed and given to all the competitors was:—"The 10-ft. passage into Bridge-street is regarded as essential if the engine-house is placed on the back of site."

This one item was of such importance that it controlled the whole of the planning.

The design selected seems to have been chosen because it ignored this instruction, and instead of (as one might have thought it in fairness should have done) disqualifying the design, it seems to have qualified it for the first place.

If the Town Council and others think this a satisfactory issue, I do not think that any of those who honestly endeavoured to comply with the instructions will be likely to agree with them.

A COMPETITOR.

*** Our correspondent, at our request, has sent us the printed Instructions and plan, which the Editor of this journal had not before seen, or some fuller observation would have been made on the point referred to. The statement in the "Answers to Questions" is quite clear, that the 10-ft. passage in the position referred to is obligatory on competitors. In ignoring it the successful competitors have made a better arrangement and a better design than was possible by adhering to it, but they have none the less infringed the conditions, and ought, in justice to the other competitors, to have been disqualified accordingly. If competitions are to be fairly conducted, the specified conditions must be adhered to, and in our opinion an assessor ought to insist on this view. —ED.

DIFFICULTIES IN SKETCHING BUILDINGS.

SIR,—Will you kindly allow me a small space in your journal to point out one of the difficulties which beset the architectural student?

The most obtrusive of these is the difficulty and delay consequent on the obtaining of permission to sketch in Museums and in ancient buildings.

It is absolutely necessary that students should sketch from the actual buildings or parts of the buildings, or at least from casts, in order to fully understand the real forms and features of both mouldings and ornaments, as well as the grouping and proportion of parts in their relation to one another. I hold, further, that it is even necessary to make sketch-models of these ornaments or mouldings in clay or wax, if you wish to have a just perception of their true form.

This is a matter which no amount of reading or illustrations will fully supply, and is to be obtained only from actual sketching from several points of view, or, better still, from modelling.

Is is not a pity that the numerous storehouses of such valuable treasures as we possess should be so inaccessible to the sketching student who is anxious to avail himself of every opportunity to sketch, and therefore impress each detail and motif of design on his memory?

Would it not be possible for the R.I.B.A. or some such body to acquire the power of granting their students sketching tickets on payment of a small sum annually, or for a stated period?

If this could be arranged it would materially assist the student, and would place within his reach the means of acquiring a thorough knowledge of the various and complex peculiarities of style, without which it is impossible for him to design new forms or adapt old.

STUDENT, R.I.B.A.

The Student's Column.

SOUND, LIGHT, AND HEAT—XVIII.

LIGHT: QUALITIES.

BODIES which readily transmit light are said to be diaphanous, or transparent; those which do so less readily and through which objects cannot be definitely distinguished are called translucent; whilst bodies which do not allow an appreciable proportion of light to pass are known as opaque. Theoretically, no natural bodies are quite impervious to light, it being assumed that in those which are of the densest opacity the rays can find their way through very thin sheets by reason of that all-pervading property of matter, porosity. Nevertheless, such substances as magnetite, pyrites, and ilmenite can only permit the passage of light rays in infinitesimal degree.

In a homogeneous medium, light is propagated in a straight line. If an opaque substance be placed in the path of a pencil of light (a collection of rays emanating from the same source) a shadow results, which shadow is most dense immediately behind the obstructing substance, and less deep on receding from it. A certain quantity of light must always pass into the shadow, even when the source of light is a mere point and not a general surface (as, for instance, the sky). This phenomenon, known as diffraction, is of much interest to the student of architecture, as in "light and air" cases the question in dispute frequently hinges on the quality and proportion of this diffraction promoted as such by the elevation of the obstructing building or other erection.

Diffraction.

It is not difficult by experiment to prove diffraction, but unfortunately the proportion of light overlapping the shadow in its relation with the quantity of light initially cut off by

the obstruction, has never been carefully studied by physicists. Consequently, we have empirical rules laid down in by-laws and the like, which rules may be adequate or inadequate, depending on the actual site dealt with. Thus the height of houses is sought to be limited by the breadth of the street between them. An angle of 30 deg., 45 deg., 50 deg., or what not, measured from the middle of the road, is brought into play. The direction of the street with reference to the source of light is not usually taken into account, though recognised in a way. As a matter of fact, the angle permitted is often too high, when the unfortunate occupants of the lower parts of the houses in the street hardly ever catch a glimpse of light which is not artificially modified.

Diffraction can be and is largely bound up artificially with reflection (of which more presently) and in practice it is the latter, taken in a compound sense, with which people are most familiar. The majority of studies in diffraction have been carried out by examining the phenomena as given by a mere pencil, or thin slit, or "slice" of light. The following experiment detailed by Ganot (*Op. cit.* p. 634) is interesting:—A beam of sunlight is allowed to pass through a very small aperture in the shutter of a dark room, where it is received on a condensing lens, with a short focal length. A red glass is placed in the aperture so as to allow only red light to pass. An opaque screen, with a sharp edge—a razor, for instance—is placed behind the lens beyond its focus, and intercepts one portion of the luminous cone, whilst the other is projected on a screen. The following phenomena are now seen:—Within the geometrical shadow a faint light is observed, which gradually fades in proportion as it is farther from the limits of the shadow. In the upper part of the screen a series of alternate dark and light bands or fringes is seen parallel to the line of shadow, which gradually becomes more indistinct and ultimately disappears. The limits between the light and dark fringes are not quite sharp lines; there are parts of maximum and minimum intensity which gradually fade off into each other. If, instead of placing the edge of an opaque body between the light and the screen, a very narrow body be interposed, such as a hair or a fine metal wire, the phenomena will be different — within the shadow there is a series of alternate light and dark bands. Another class of diffraction is produced by allowing a pencil of light to traverse an aperture, the latter being in the form of a narrow slit in an opaque screen.

The difficulty, from the practical point of view, of applying methods of proving diffraction has already been foreshadowed in the sentence showing that the phenomenon is much bound up with reflection. The grounds for compensation are based almost always on the total amount of light cut off from "all sources." The lawyer makes no pretence of separating these sources, so that the expert witness must combine these three things—light due to diffraction, reflection, and (it may be) refraction.

Intensity of Light.

The following well-known laws may here be quoted in relation to the intensity of light:—

1. The intensity of illumination on a given surface is inversely as the square of its distance from the source of light.

2. The intensity of illumination which is received obliquely is proportional to the cosine of the angle which the luminous rays make with the normal to the illuminated surface.

The Photometer.

This instrument is for measuring the intensity of light. In the form devised by Rumford, the qualities of two shadows thrown from one object (usually a rod) by two lights of different intensity, are so adjusted by altering the position of one of the lights, that the two shadows shall appear identical. It will be seen that to get this result, the relative position of the two lights is the controlling factor. The intensities of the two lights (*i.e.*, the illumination they give at equal distances) are found to be directly proportional to the squares of their distances from the shadows.

The best-known photometer in this country is that of Bunsen, which depends on the appearance of a specially-prepared grease-spot in lights of certain intensity—known as standard lights. By this means the illuminating power of coal-gas, and other artificial lights, is tested.

Turning to another class of instruments, for recording the intensity and duration of sunshine, we are confronted with many difficulties which these instruments are supposed to take into account. The immediate intensity of a sunbeam can readily be ascertained by standard measure, but that is a different matter to ascertaining successive and ever-varying changes in general intensity. Clouds, relative clearness of the sky, varying thickness of atmosphere depending on position of the sun, and other, mainly meteorological, phenomena have to be taken into account. Photography can give a continuous record of general diffused light throughout the day; but it has not, up to the present, dealt satisfactorily with direct sunshine, so far as we are aware.

The duration of sunshine is best measured, perhaps, by a ball of glass, which acts as a "burning lens." A cardboard strip divided into hours and parts is fixed under the ball; when the sun shines a spot is burned, and if it shines continuously for some hours a line is traced for that period on the cardboard strip.

BOOKS RECEIVED.

GAS AND PETROLEUM ENGINES. Translated from the French of Henry de Graffigny, by A. G. Elliot, B.Sc. (Whittaker & Co.).

CHEMISTRY IN DAILY LIFE. By Dr. Lassar-Cohn. Translated by M. M. Pattison Muir (H. Grevel & Co.).

JOURNAL OF THE SANITARY INSTITUTE. Vol. XIX.: Part III. (Edward Stanford.)

THE LAW OF NEGLIGENCE. By T. W. Saunders. Second Edition; re-written with additions by E. Blackwood Wright (Butterworth & Co.).

OBITUARY.

MR. LATIMER CLARK.—By the death of Mr. Latimer Clark, F.R.S., last Sunday, at the age of seventy-six, we lose another of the few remaining pioneers of submarine telegraphy. He was the fourth President of the Institution of Electrical Engineers, which was then called the "Institution of Telegraph Engineers," and down to his death took the greatest interest in its welfare. Only last January, in presenting several volumes of pamphlets and papers of the late Mr. Jacob Brett to the Institution, he said:—"I am one of the older members, and, being about to throw off harness, I feel it a duty to collect these unique and invaluable records and to place them in hands where they will remain permanently secure." It was a great satisfaction for him to know that these records prove without the possibility of a doubt that the English nation was the first to introduce submarine telegraphy to the world. Mr. Clark's earliest work as an engineer was in assisting to construct the Britannia Tubular Bridge across the Menai Strait, his brother, Mr. Edwin Clark, being the resident engineer. Whilst there he arranged a time-gun to be fired electrically every evening at eight o'clock, and it was this contrivance that brought him to the notice of the chairman of the Electric Telegraph Company, who appointed him in 1850 assistant-engineer, and shortly afterwards enginner-in-chief. In 1854 he invented the system of the pneumatic transmission of messages, which has been so extensively used by the Post-Office. Two years later he invented the double-cup insulator, now universally employed in telegraph work, and soon afterwards "Clark's Compound," which is still widely used for insulating and protecting cables. Mr. Latimer Clark was one of the most useful members of the Committee appointed by the Government in 1859 to inquire into the cause of the numerous failures of the attempts at oceanic telegraphy, and he issued a valuable supplementary report giving the laws of the rise and fall of the electric current in a submarine cable. For the next ten years, in partnership with Sir Charles Bright, he was a consulting engineer, and supervised many cable enterprises. During this period also he helped to crystallise electrical nomenclature and methods. He originated the system of electrical measurements in volts, amperes, and farads, and his book, published in 1868, was for many years the standard work on the subject. In 1873 he invented the Clark cell, which was adopted by the Board of Trade twenty years afterwards as the standard cell for electrical pressure. The volt is legally defined as 0·6974 of the pressure between the poles of a Clark cell at a temperature of 15 deg. centigrade. As head of the firm of Clark, Forde, & Taylor, he was concerned with the production of over 100,000 miles of submarine cable, and as partner in the late well-known electrical firm of Latimer Clark, Muirhead, & Co., he brought out many important inventions and improvements in electrical apparatus. He was also head of the firm of Clark & Standfield, the well-known dock engineers. Mr. Clark was deputy-chairman of the St. James and Pall Mall Electric Lighting Company, and was a director of the Central Electric Supply Company. Notwithstanding his numerous business engagements in later years he found time to make many original investigations both in electricity and astronomy. He was a Chevalier of the French Legion of Honour, and was elected a Fellow of the Royal Society in 1889.

COLONEL WARING.—It is with great regret that we announce the death of Colonel George E Waring, M.Inst.C.E., who was for a short time the able Commissioner of Street Cleaning in the City of New York. His death was due to an attack of yellow fever, caught during a recent visit to Havana. He was a well-known and able writer on sanitary matters, among his works being "Sewerage and Land Drainage," "The Sanitary Drainage of Houses and Towns," and "Modern Methods of Sewage Disposal," the last being one of the best short accounts of the subject we know, although, of course, some progress has been made in our knowledge of methods and principles since its publication in 1894. His book entitled "Street-cleaning and the Disposal of a City's Wastes" is a record of his important and laborious work as Commissioner of Street-cleaning in New York, and shows, without a trace of boasting, how he purified a corrupt department, and cleansed the vile streets of the metropolis of the New World. But his time and thought were not entirely given to sanitation. A volume of short stories, and at least three books of travels in Europe, bear witness to the breadth of his sympathies and to his literary ability.

MR. T. KENRICK.—The death has just taken place, at his residence, 4, Brompton-road, Southport, at the age of seventy-two, of Mr. Thomas Kenrick, the oldest master-builder in the town. He went to Southport thirty-five years ago.

MR. JOHN GREEN.—The death is announced of Mr. John Green, contractor, which occurred at his residence in Warkworth on the 30th ult. Deceased, who was sixty-eight years of age, commenced business on his own account some forty years ago as a contractor and builder, and a few years later entered into partnership with the late Mr. Thomas Douglas, of Amble. The firm carried out some large contracts. At Mr. Douglas's death Mr. Green took his sons into the business.

GENERAL BUILDING NEWS.

ST. MARYLEBONE WORKHOUSE: NEW WARD BLOCKS.—These buildings, now in course of erection, comprise two large double ward blocks, connected on the ground floor and basement. Each block will be three stories in height above the ground floor, with a fourth story over the centre part. The top and third floors will contain wards and day rooms for infirm men too feeble to leave them. The roofs over the wings will, however, be flat, and available for such of those inmates as may be able to take advantage of them. The second floor will contain dormitories only, and the first dormitories and two large day-rooms. The outer wing of both blocks will contain, on the ground floor, accommodation respectively for male and female imbeciles and lunatics, the inner wings being divided into two large general day-rooms. The centre rooms between the blocks on this floor will be occupied as an overflow dormitory. The total accommodation will be 555 beds for old and infirm men, eleven male and ten female imbeciles, and three male and three female lunatics. The basements are divided into a number of large rooms, the effective lighting and ventilating of which is ensured by wide areas both back and front, and in addition the levels of the ceilings will be 4 ft. above the general ground level. These rooms will be devoted to a complete set of workshops. The centre part of each block contains the general staircase, which will be lined throughout with white glazed bricks. Light and ventilation is provided by a large lantern and skylights. Adjoining these staircases on each floor are officers' rooms and small one-bed dormitories; the towers in the rear contain the bath-rooms, lavatories, water-closets, &c. Airing yards, properly divided for classification, will be formed both at the back and front of the buildings. The walls of all dormitories will be finished with cement dados 4 ft. 6 in. high, and plaster above. The day-rooms will have glazed brick dados. All bath-rooms and lavatories will be lined with white glazed tiled dados, 7 ft. high; and the water-closets, &c., will be faced their whole height with white glazed bricks. The front of the building and returns will be faced with hard-faced red bricks, relieved with stone bands and dressings. The ground-floor story will, however, be entirely in rusticated stone. The back elevation will be faced with white pressed bricks, relieved with red bands and arches to match the adjoining older buildings. The work is being carried out at a cost of 52,100*l.* by Messrs. G. H. & A. Bywaters & Sons, from the designs and under the superintendence of the architect, Mr. A. Saxon Snell. The quantity surveyors are Messrs. Northcroft, Son, & Neighbour; and the clerk of works is Mr. Frederick W. Lee.

ST. PETER'S EPISCOPAL CHURCH, GLASGOW.—The memorial stone of St. Peter's Episcopal Church was laid on the 22nd ult. by Lord Kelvin. The church is being built on a site in Gardner-street, off New City-road, from plans prepared by Mr. James Chalmers, architect, Glasgow. The interior consists of a large nave, two aisles, and chancel. The church is 85 ft. long, 55 ft. high, and 75 ft. broad, and is divided into nave and aisles by four bays. The eastern bay forming the chancel is divided from the nave by a chancel arch and rood screen. The eastern window is a three-light one. The

chancel is 32 ft. deep, and extends the full width of the nave—29 ft. To the north of the chancel is the organ-chamber, 21 ft. by 25 ft.; and on the south is a small chapel, similar in size to the organ-chamber. The interior is finished with Bath stone and Ruabon red brick, while the pillars are of Prudham stone, from Northumberland. Stone from Giffnock quarries is used for the arches, but the pulpit and altar rails are of white stone. The whole of the work was contracted for by Messrs. Morgan & Son.

ST. ALBAN'S CHURCH, BLACKBURN.—On the 15th ult. the foundation stone of St. Alban's new church was laid by the Bishop of the Diocese. The church consists of a nave and aisles. The aisles are continued right round the sanctuary. There are north and south transepts, opening into two side chapels. The church will be built of Yorkshire parpoint, with Bath stone dressings. The west window will consist of nine lights. Each transept will be lit with seven-light windows. There will be large working, clerks', and clergy's vestries, the heating apparatus being underneath. The design includes a loft, tower, and spire, to contain a full peal of bells. The church is estimated to cost 20,000*l*. Mr. Goldie, of London, is the architect; Mr. Boland the contractor, aud Mr. J. Price, of Preston, is the clerk of works.—*Catholic Times.*

MISSION CHURCH, REDLAND, BRISTOL.—A temporary church (St. Katharine) was dedicated at Redland on the 22nd ult. The building has been erected on land in Salisbury-road. Messrs. P. Munro & Sons were the architects. The building is 108 ft. long and 36 ft. wide, the roof rising to a height of 50 ft. The cnancel and sanctuary at the east end are approached by a few steps. There is a porch on the north-west side. The building, which is constructed of Pennant stone, is Gothic in style, the open roof being of pitch pine, and covered with Broseley tiles.

PARISH CHURCH, QUEENSFERRY.—This church, which during the past four months has been undergoing alteration, was reopened on the 23rd ult. The church, which was erected in 1633, bears the marks of frequent alteration. The fabric remains as it was, but the interior has been renovated and decorated. The old-fashioned pulpit, with its heavy canopy, and the straight-backed pews have been removed. The interior has been replastered, and stone mullioned windows, with cathedral tinted glass, have been introduced. A broad central aisle now replaces the former side aisles, and the gallery has been modified. The most characteristic feature of the new work is the stone chancel, containing a beautiful oak communion table, a baptismal font and reredos. In the east gable a two-light stained glass window has been inserted. The architect was Mr. P. M'Gregor Chalmers, Glasgow.—*Scotsman.*

NEW VESTRIES AT THE PARISH CHURCH, YARMOUTH.—On the 27th ult. the stone-laying ceremonies in connexion with the proposed new vestries at the parish church took place. The site of the new vestries is at the north-east end of the edifice, and the architect is Mr. F. L. Pearson, of London.

CHURCH RESTORATION, STAINTON, YORKSHIRE.—On the 28th ult., the Archbishop of York attended the re-opening service in connexion with St. Winifred's Church, Stainton, near Rotherham. The edifice has been restored at a cost of some 1,100*l*., exclusive of the tower, which received attention three years ago, at an outlay of 350*l*. The restoration has been carried through under the direction of Mr. J. D. Webster, architect, of Sheffield, and the contractors were Mr. J. Fidler, Eckington, builder; Messrs. J. Badger & Sons, Sheffield, joiners' work; and Messrs. Wright, Sheffield, heating apparatus.

ORGAN TRANSEPT, ANSFORD, SOMERSETSHIRE.—The Archdeacon of Wells opened, on the 26th ult., the new organ transept which has been erected at the parish church. The new transept has been built by Messrs. Francis & Sons, of Castle Cary, from the plans of Messrs. C. & C. Benson, architects, of Yeovil.

CHURCH, LYTHAM, LANCASHIRE.—The new Church of St. Thomas, Lytham, will shortly be commenced. A site has been obtained on South-drive upon which to erect the edifice, which is estimated to cost 8,000*l*. The architects, Messrs. Austin & Paley, have prepared plans which provide for the accommodation of some 800 worshippers.

NEW CATHOLIC CHURCH, STANLEY, DURHAM.—The designs for this church, which is in progess, show accommodation for about 700. The buildings are to be in the Early English style, stone and slated. The body of the church consists of a single span nave and transepts with west end gallery and provision for possible galleries in both transepts. The main and two side altars are in separate apses. There are separate sacristies for clergy and servers in communication with the presbytery and the east end of the church, and confessionals and baptistry are offshoots from the main building. The whole is to be heated by hot-water apparatus. The architect is Mr. Chas. Walker of Newcastle-on-Tyne.

CONGREGATIONAL CHURCH, MUSWELL HILL.—The foundation-stone of a new Congregational church was laid at Muswell Hill on the 22nd ult. The architect is Mr. P. Morley Horder.

MEMORIAL CHURCH, TOPCROFT, NORFOLK.—On the 25th ult. the Congregational Church which has been built at Topcroft, in memory of the late Mr. Samuel Newton Delf, was opened. The new building, which has been designed by Messrs. Edward Boardman & Son, of Norwich, consists of church, porch, and vestry. The size of the church is 38 ft. by 23 ft. 6 in. It is lighted by a mullioned window at the west end, with four windows on the south side and two on the north. The rostrum is at the east end, and behind it is the door of the vestry. The contractors were Messrs. S. Y. Brock & Sons, of Alburgh.

CONGREGATIONAL HALL, BUNGAY, SUFFOLK.—On the 26th ult. a new lecture hall, attached to the Congregational Church, Bungay, was opened. The hall is 43 ft. in length by 19 ft. in width, and 15 ft. in height. Attached to the hall, and forming part of the main building, is the minister's vestry. Messrs. G. Martin & Son were the contractors, and the building has been erected from plans and specifications prepared by Mr. J. O. Rees.

PRIMITIVE METHODIST CHAPEL, BURSTWICK, YORKSHIRE.—On the 27th ult. the new Primitive Methodist Church was opened at Burstwick. The plans were prepared by Mr. T. B. Thompson, of Hull. The chapel and school are separated by a movable screen. There is a class-room for about twenty persons, and a kitchen and heating vault. A small vestry has been erected at the south side of the building. The total cost will be about 1,025*l*.

BRITISH SCHOOL, DORKING.—The new British school which has been erected in Vincent's-lane, Dorking, was opened on the 19th ult. The building, which provides accommodation for 400 boys and girls, has been erected by Messrs. Colls & Sons, of London, from the plans of Messrs. Balfour & Turner, architects, London.

ST. MARY'S SCHOOLS, ASTON, BIRMINGHAM.—The foundation-stone of a new infants' school was laid on the 29th ult. at Aston. Mr. Edward Holmes, of Birmingham, prepared the plans of a school to accommodate 400 children, and comprising school-room, two class-rooms, babies'-room, mistress'-room, and the usual adjuncts. The building will be of brick. Messrs. Lee & Son are the contractors.

SCHOOL, WEST TIVERTON.—On the 29th ult., the block of new schools at West Tiverton, which have been erected by the School Board of that place, was opened. The architects are Messrs. Silcock & Reay.

ROMAN CATHOLIC SCHOOLS, BIRTLEY.—The new school buildings in connexion with St. Joseph's Roman Catholic Church at Birtley were opened on the 29th ult. The buildings have been erected from the designs of Mr. Charles Walker, of Eldon-square, Newcastle, by Messrs. Joseph Burnett & Son, of Birtley, at a cost of 2,500*l*. Accommodation has been provided for over 300 scholars.

RESTORATION OF ORDSALL HALL, NEAR MANCHESTER.—The whole of the restorations of this ancient hall, and the additions and alterations which have been made, are now practically complete. Messrs. Darbyshire & Smith are the architects, and Messrs. Brown & Son the contractors for the whole of the works.

SOLDIERS' HOME, LONDON.—Alterations and additions to the Soldiers' Home in Buckingham Palace-road have been carried out. A new hall has been built and sixteen more beds added, ten of them in private cubicles over the hall, and approached by a corridor from the old building. The hall is 38 ft. by 25 ft., and will seat 150 persons. The rooms of the Lady Superintendent and her staff are shut off from the soldiers' department. The architect of the new building was Mr. Robert Curwen.

CLOCK TOWER, SKEGNESS.—The foundation-stone has been laid of a clock tower at Skegness. It is to serve as a memorial of her Majesty's reign. The architect is Mr. Winter, and Mr. H. W. Parker, of Boston, is the builder. For the basement, ornamental Ancaster stone will be employed, and the remainder of the tower will be treated in red brick, and when completed will stand 60 ft. high.

LIBERAL CLUB, GREENFIELD, LEEDS.—Sir James Kitson, Bart., M.P., opened a new Liberal Club at Greenfield, on the 22nd ult. The building is of stone, and it has been erected at a cost of close upon 1,000*l*., from the plans of Mr. J. T. Bradbury, architect, Greenfield.

TOWN HALL, OUNDLE.—The committee have provisionally accepted the tender of Messrs. Siddons & Freeman, of Oundle, for 1,725*l*. for the erection of this building. Mr. J. B. Corby, Stamford, is the architect.

UNIVERSITY COLLEGE, ABERYSTWITH.—On the 26th ult. the new central block of Aberystwyth University College was opened by Sir William Harcourt. The college, which was opened in 1872. faces the sea at the side of Castle Hill. In 1885 a large part of the building was destroyed by fire, but it was immediately rebuilt. On the south side of the house a new wing had been previously erected, and after the fire it was adapted to the requirements of a school of science. But between these two blocks of building of yellow freestone there remained the cemented low central building of the old house with its wings and offices. The work that has now been undertaken and brought practically to completion has been the rebuilding of the central block, to provide those laboratories, lecture rooms, and other work-rooms essential to the development of the educational work of the institution, to unite the previously existing and semi-detached wings of the science and art department, and to make the building into one complete fabric with a centre worthy of the earlier wings. The central block is four stories in height, with a basement under the whole of it. The basement provides two rooms towards the sea, cellars for the purposes of heating and for the engines and other apparatus in connexion with the ventilation of the building and the extraction of fumes from the various laboratories. On the ground floor is provided an entrance from the sea front, with a waiting-room attached, with halls and corridors connecting the arts and science wings of the building, together with a central hall and staircase. The front towards the sea is occupied with the official rooms of the college, the principal's room, the registrar's room, the office, and with a small laboratory connected with existing laboratories of the science wing. On the east or King-street front are the caretaker's house and a series of cloak-rooms and lavatories. On the first floor are provided a lecture-room, 27 ft. by 24 ft.; a students' laboratory, 36 ft. by 31 ft.; a suite of rooms for the analyst, a balance-room with a private-room, and store-rooms in connexion with them. On the second floor are an advanced laboratory of the same size as the lecture-room below it, a lecture-room for botany and zoology, 36 ft. by 22 ft., a smaller lecture-room for zoology and botany, with private rooms, diagram and incubator rooms with private rooms, preparation rooms, and diagram rooms attached. On the third floor are two laboratories for botany and zoology, one for men and one for women, a lecture-room for agriculture and veterinary science (with the usual accessory rooms in connexion with them). The architect was Mr. C. J. Ferguson.

VOLUNTEER DRILL-HALL, BOURNEMOUTH.—The foundation-stone of a drill-hall for the Bournemouth batteries of the 1st Dorset Brigade of Artillery Volunteers was laid recently. The new building will contain a drill-hall, 92 ft. by 60 ft., the special flooring necessary for heavy gun practice being laid by the Royal Engineers, under the direction of the Crown authorities. On the left of this hall will be the magazine and necessary offices and rooms, and quarters for the resident sergeant-instructor. The total cost of the building will be about 3,000*l*. It is being erected on a site at the Christchurch-road end of the Lansdowne-road. The architects are Messrs. Creeke, Giffard, & Oakley, and the builders are Messrs. Miller & Sons, of Bournemouth.

NEW OPERATING THEATRE, SWANSEA HOSPITAL.—The new operating theatre which has been added to Swansea Hospital was opened on the 28th ult. The new building is connected with the west corridor of the hospital. It is oval in shape, 26 ft. long by 22 ft. wide, and the roof is in the shape of a dome. The exterior is designed so as to be in keeping with the surrounding hospital buildings, being built of native stone in courses, with dressings of Bath stone. The contractor for the general work was Mr. Henry Billings, of Swansea, and the architects are Messrs. Wilson & Moxham, of Swansea.

PUBLIC HALL, HARTLEY WINTNEY, HANTS.—The opening of the parish hall, which building has been erected by public subscriptions in commemoration of the Diamond Jubilee of her Majesty Queen Victoria, took place on the 27th ult. The hall is capable of seating over 400 persons. The architect was Mr. T. E. Collcutt, while Messrs. Pool & Son were the builders.

NEW WING, STOCKPORT INFIRMARY.—The foundation stone of the new north wing of this building was laid on the 27th ult. The extensions now in course of erection consist of a pavilion block four stories high, in line with, and in continuation of, the present range of buildings facing Wellington-road, and a laundry and mortuary block on the land at the rear of the main buildings. The pavilion block covers an area of about 420 superficial yards, and will provide the following accommodation: Two wards for fourteen beds each, with the usual ward scullery and bath-room at the entrance end of the wards, and a suite of sanitary offices in a tower at the far west end of ward; a suite of servants' bedrooms for fourteen beds on the top floor, with similar sanitary and bath-room accommodation; an operating theatre, north lighted, with suite of rooms attached for anæsthetics, instruments, &c., and surgeons' rooms, and a two-bed surgical ward; matron's suite of rooms, consisting of sitting, bed, and bath rooms; day room on the ground-floor level, with a patients' recreation room under the wards on the lower ground-floor level; and on this floor also a doctors' bath-room and sanitary conveniences; various store-rooms and heating cellar. Communication is obtained between the whole of the above rooms by means of a stone staircase. The laundry and mortuary block covers an area of about 230 superficial yards, and comprises washhouse, with finishing room, boiler-house, coals, and servants' conveniences. The mortuary consists of a small room fitted with three slabs, and a post-mortem room adjoining. The area of the portion of Frances-street, at the rear of the main buildings, which has been acquired for these extensions, is about 300 superficial yards. The architects are Messrs. Woodhouse & Willoughby, of Manchester. The contractors are Messrs. Meadows.

CHURCH INSTITUTE, GATESHEAD.—On the 29th ult. this building erected in connexion with St. Paul's Church, Low Teams, Gateshead, was opened. The Institute consists of a billiard-room and committee-room on the ground floor, the latter room opening into the Parochial Hall, and on the first floor a room for amusements, and a reading-

room. The cost of the building was 630*l.* It has been built by Mr. J. Anderson, of Newcastle, from designs by Messrs. Oliver & Leeson.

CO-OPERATIVE STORES, CONSETT, DURHAM.—On the 29th ult. the foundation-stones of the new business premises for the Consett Co-operative Society were laid on the site of the buildings destroyed by fire in November last. The contractor is Mr. J. G. Bradley, Durham, while the designs were prepared by Messrs. Liddle & Brown, architects, Newcastle.

BUSINESS PREMISES, LONDON.—On the 27th ult. the foundation-stone was laid, at 29, Great St. Helen's, of a building which will comprise about a hundred offices. The land covers an area of 7,000 ft., and entrance to the property will be gained from Great St. Helen's and St. Mary-axe. The new building is being erected by Messrs. Colls & Sons, from plans prepared by Mr. T. H. Smith, architect.

TOWN HALL, COLCHESTER.—The foundation-stone of this building was laid on the 31st ult. by the Duke of Cambridge. The architect of the Town Hall, which was illustrated in the *Builder* for September 4, 1897, is Mr. John Belcher, of London. The cost will be about 36,000*l.*

SANITARY AND ENGINEERING NEWS.

BRIDGE, LEICESTER.—On the 24th ult. the Mayor of Leicester opened Newarke Bridge, which has been erected from the designs of the Borough Surveyor, Mr. G. E. Mawbey. Messrs. Bentley, Son, & Partington were the contractors.

THE REBUILDING OF KEW BRIDGE. — At the monthly meeting of the Middlesex County Council on the 27th ult. the Finance Committee on behalf of the joint committee of Surrey and Middlesex, presented supplementary estimates to the extent of 35,000*l.* for the rebuilding of Kew Bridge. The report of the joint committee showed that while the estimate of the total cost of the widening, given by their engineer—Sir J. Wolfe Barry—was 118,000*l.*, the lowest of seven tenders received for the work, that of Mr. Easton Gibb, of Skipton, Yorkshire, was £169,288. In reply to a request for an explanation, Sir J. Wolfe Barry reported that his estimate was based on the prices paid for similar work at the Tower Bridge, with a considerable addition. He suggested that the cost of all work in the neighbourhood of London had been steadily increasing during the past two years owing to the obligations imposed by the Employers' Liability Act, the action of the London County Council with regard to the terms of labour, and the great demand for materials at the present time. He estimated that 20,000*l.* to 25,000*l.* might be saved by the substitution of internal brickwork or concrete for stonework. The committee further reported that they had ascertained that a reduction of about 20,000*l.* might be made on Mr Gibb's contract in the way suggested, and they recommended that the tender should be accepted for a sum not exceeding 150,000*l.*, and that a Bill be promoted to authorise the additional borrowing. Mr. Burt, of Highgate, moved as an amendment to the report of the joint committee that the Council should not entertain the proposed additional expenditure, but should refer the matter back to the joint committee with a view of bringing the total cost of the bridge approximately within the amount authorised by Parliament, and this was carried by thirty-two votes to eight.

LAUNCESTON SEWAGE WORKS.—New sewage works have just been completed at St. Leonard's, Ford. The works, which were commenced in March, 1898, by Mr. E. Sharland, who was the contracter, acting under the instructions of Mr. A. P. I. Cotterell, Assoc.M.Inst.C.E., at a total cost of 4,200*l.*, were opened on the 25th ult.

THE DRAINAGE OF DOUGLAS.—At Douglas on the 27th ult. a committee of the Tynwald Court sat in the matter of the application of the Douglas Corporation to Tynwald, for authority to borrow 20,000*l.* for the purpose of improving the drainage of Douglas in addition to the sum of 35,000*l.* already authorised to be borrowed for the purpose. Mr. Kneen supported the application of the committee, while Mr. Hughes James opposed on behalf of a number of ratepayers, who held that the high and low level scheme of drainage was unnecessary, and that a gravitation scheme was sufficient for the town. There were fifty-eight basements in the town below the high-tide mark. Mr. E. H. Stevenson, C.E., of London, the author of the high and low level scheme adopted by the Corporation, gave evidence as to the liability of the basements in the town to be flooded, and said that he had seen black sewage matter in some of the basements at high water. Several householders and owners of property in the low-lying part of Douglas gave evidence in support of the opposition. They declared that any flooding was not due to sea-water, but heavy rains, and had been obviated since storm outlets had been provided. It was, they declared, a simple matter to put in a contrivance to keep the water out. The committee adjourned *sine die.—Liverpool Courier.*

WATERWORKS, ABERGAVENNY. — The members of the Urban District Council visited, recently, the site of their water works to inspect alterations, &c. In 1859 the water was conveyed direct to the town in pipes. In 1886 the old commissioners constructed a tank with a capacity of 60,000 gallons, and in 1897 another tank of like dimensions was commenced, and has now been completed. The work has been carried out by the Town Surveyor, Mr. J. Haigh.

WATERWORKS, GORPLEY, LANCASHIRE.—At a meeting of the Todmorden Town Council, held on the 26th ult., it was resolved to appoint Mr. G. F. Deacon, C.E., as engineer for the new waterworks to be constructed at Gorpley.

WATERWORKS, MORPETH, NORTHUMBERLAND.—On the 27th ult. the new reservoir, filter beds, and other additions to the Morpeth Corporation Waterworks were opened. The cost of the works has been about 5,000*l.* Mr. Dinning was the engineer, and Mr. Carr was the contractor.

STAINED GLASS AND DECORATION.

MEMORIAL WINDOW, GLASGOW FREE CHURCH COLLEGE. — A memorial window to Professors Candlish and Drummond, which has been erected in the grand staircase of this college, was unveiled by Professor Bruce on the 19th ult. The window occupies the south wall of the grand staircase, is in three lights, and is 18 ft. high. The subject runs through all the three openings. The window has been executed under the direction of Mr. John J. Burnet, A.R.S.A., and from designs drawn by Mr. David Gauld, by Messrs. J. & W. Guthrie & Andrew Wells, Limited.

WINDOW, WESLEYAN CHURCH, JESMOND, NEWCASTLE. — The stonework of a new window, designed by Mr. J. W. Taylor, architect, of Newcastle, has just been completed in Jesmond Wesleyan Church, and Messrs. Wailes & Strang have been chosen as the artists to fill the window with stained glass.

FOREIGN.

FRANCE.—M. Falguière has just finished the model of the monument which is to be erected to the memory of Alphonse Daudet.——The *Direction des Beaux Arts* is very shortly going to place the four large compositions by Puvis de Chavannes in the Panthéon. They represent scenes in the life of St. Geneviève. There will then only remain four pictures of less importance, which are to be placed in the frieze above. These have been left unfinished by the artist, but are in a sufficiently advanced state to be completed by one of his pupils.——M. Vacherot, Chief Gardener of the City of Paris, has completed his plans for the gardens of the 1900 Exhibition. They will not be confined to the Champ de Mars, but will include the Esplanade des Invalides, and the underground station at the Invalides will be quite hidden. ——M. Gérôme has just finished the model of the monument which the Municipality of Chantilly wish to erect, in memory of the Duc d'Aumale, in the grounds of the Château. —— On Sunday last a new railway station was inaugurated, besides other new buildings, at Arras.——The municipality of Pontoise have opened a competition for plans for a new savings bank.——MM. Cavel & Foucault have been appointed Sectional architects to the Paris Municipality, in place of MM. Gion & Auburtin who are retired, and now occupy the position of honorary architects.——An American Committee has been formed to erect a monument in Paris to the memory of Lafayette.——The excavations in progress at Timgad, in Algeria, under the direction of M. Albert Ballu of the "Monuments Historiques," have resulted in the discovery of the remains of a temple dedicated to Jupiter, Juno, and Minerva, a public building with some figure-subjects in mosaic, and a large building outside the walls, supposed to have been Thermæ.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Mr. Spencer Chadwick, architect, has entered into partnership with Mr. Philip E. Pilditch, and their practice will be carried on at 2, Pall Mall East, under the style of Pilditch, Chadwick, & Co.

ELECTRIC LIGHTING IN MANCHESTER.—On the 24th ult. Major-General H. Darley Crozier, R.E., an Inspector of the Local Government Board, held an inquiry at the Manchester Town Hall into an application by the City Council for sanction to borrow 200,000*l.* for purposes of electric lighting in the city and outside districts. The inquiry was attended by Mr. C. H. Wordington, City Electrical Engineer, and others. Mr. Hudson (Deputy Town Clerk) said the electrical undertaking had been in existence a little over five years. At the present time there were 214,946 eight-candle lamps connected, and 31,760 lamps waiting to be connected. The Corporation would not be able to connect those lamps until plant which had been authorised by the Local Government Board, and was now being constructed, had come into operation. The charges for electrical current were 5d. per unit fixed charge, and for long hours consumers 1½d. per unit, and 7*l.* per annum per kilowatt. During the four years and eight months that had elapsed from the initiation of the undertaking until March last, the Corporation Electricity Committee placed to reserve and renewal funds 34,245*l.*, and handed over to the city fund 26,694*l.*, making a total of 60,939*l.*, which, for the period over which it extended, was equal to a rate of rather more than a penny in the pound. That indicated that the electric undertaking of the Corporation had been a marked success.

PROTECTION OF BUILDINGS FROM FIRE.—A novel feature in connexion with the meeting of the various fire brigades to take part in the Lord Mayor's procession will be the delivery of a lecture to firemen on "Fire and Fire Extinction," by Professor Vivian B. Lewes. The lecture is to be given at the London Institution, Finsbury-circus, at 5 p.m., on November 8, the day preceding that on which the procession takes place, and will be illustrated by numerous experiments. We understand that Captain Shean, of 18, Finsbury-circus, E.C., is undertaking the work of organisation, and is prepared, upon the receipt of a stamped and directed envelope, to forward tickets gratis to those in any way interested professionally in the protection of buildings from fire.

NEW PULPIT AND WINDOW, ACOMB, YORKSHIRE.—The Archbishop of York dedicated on the 25th ult. a new pulpit and window which have been placed in the Parish Church of Acomb, near York. The lectern and gas brackets are of brass. Messrs. Earp & Hobbs, of London and Manchester, have executed the work. The window, of stained glass, occupies a position in the north aisle just to the right of the pulpit. It is lancet-shaped, and the subject pourtrayed is the Ascension. This work has been executed by Messrs. Lavers & Westlake, of London.

OPEN SPACES.—The Paddington and Hampstead Vestries have voted, respectively, sums of 500*l.* and 10,000*l.* towards the purchase-moneys, about 41,000*l.*, for acquiring the Golder's Hill Estate, adjoining the road which skirts the Hampstead Heath between North End and Child's Hill. It is proposed that the London County Council should convert the house for purposes of a natural history and botanical museum, in respect of their technical education work, and retain the garden and rosary as a botanical garden for the use of students and the general public. The contributions include those by the Council, 12,000*l.*; Middlesex County Council, 500*l.*; and the City of London Parochial Charities Fund, 1,250*l.*——A movement is a-foot for securing some land at Lee, in Kent, including the Manor House and its grounds.——A playground is being laid out in Kipling-street, behind Guy's Hospital, and steps are being taken for securing some ground as a public park on the Thames side near the outfall of the river Wandle.——We read, too, that the Duke of Bedford has informed the St. Giles's District Board of Works of his intention to clear the sites of Southampton-mews and Montague-mews, Russell-square, where the leases will very soon expire, and convert the ground into a garden for the enjoyment of his tenants in the vicinity.

GLASGOW BUILDING TRADES EXCHANGE.—The fourth annual meeting of the building trades of Glasgow and district was held on the 26th ult., in the rooms of the Exchange, Colonel Bennett presiding. The Secretary read the annual report by the executive. The past year, it stated, had been successful. The income had been 822*l.* 3s. 1d., and the expenditure 672*l.* 12s. 7d., leaving a net credit balance on the year's working of 149*l.* 10s. 6d., from which a 5 per cent. dividend would be paid. During the year the membership had been increased by 34. With reference to the Workmen's Compensation Act, the questions of forming a company and of getting specially low terms from insurance companies had been discussed, and it was decided to wait at least a year in order to see the nature of the risks to be faced. The Chairman moved the adoption of reports, and Mr. Shaw seconded. Mr. Goldie expressed himself as against a licence being procured for the premises. He also called attention to what he called the severe punishment builders had to submit to by measurers. They might perhaps finish a job which had been going on for years, and they could not get their money for months. They grumbled individually, but that would do no good; the Exchange should take the matter up. The Secretary said the matter had been before the executive, and a conference had been invited of delegates from the various masters' associations. The Chairman said that the hanging up of measurements for three, six, twelve, and eighteen months was beyond a joke. He thought there ought to be a clause in contracts allowing them 5 per cent. after three months from the finish of a contract. The reports were adopted, and the executive, office-bearers, auditors, officials, &c., were re-elected.

PETERBOROUGH BRICK TRADE.—The brick industry around Peterborough was perhaps never, says the *Peterborough Advertiser*, in a more prosperous condition than at the present time, the output never greater, and the demand never keener. Among the leading firms represented at a recent meeting of brickmakers served by the Great Eastern Railway system, held to consider the question of railway rates, were Beeby's Brick Company, Peterborough; Bray & Co., Peterborough; F. Jewson, Earith; T. & M. Plowman, Peterborough and Edmonton; and Thoday & Co., Cambridge. Mr. F. Jewson, J.P., was voted to the chair, and detailed the result of the interviews that had taken place with Sir William Birt at Liverpool-street Station, on three different occasions, and which culminated in a proposal to pay an additional cwt. per thousand upon the rates quoted. This proposal the chairman considered to be a just and equitable one, and said it

only remained for brickmakers generally to accept the terms offered, and they would be carried into effect. On the other hand, the rate was not compulsory, and brickmakers could continue to pay actual weight if they so preferred. The proposals met with the general acceptance of the meeting.

THE EDINBURGH BUILDING TRADES EXCHANGE.—The first annual meeting of the shareholders of the Edinburgh Building Trades Exchange was held in the rooms at Shandwick-place, on the 26th ult., Mr. Peter Lawrence, surveyor, Chairman of the Company, presiding. The Chairman said the venture was a new one, and it had so far proved very satisfactory, as it had enabled them to pay a dividend of 5 per cent. That did not exhaust their resources, because they had a lucrative source of income from the catalogue which was being prepared, and which would enable them to pay a larger dividend next year. The Exchange was founded to weld together the different branches of the building trade and the manufacturers. They had learned their lesson from America, not directly, but through Glasgow, where an Exchange was started on most successful principles. Since then Exchanges have been formed in Newcastle and Halifax, and he believed that in the course of time all the other great building centres in the country would see that it was to their advantage to have a place like theirs, where the builders could meet together with the manufacturers and discuss matters in which they were interested. The membership was increasing, and what they desired was that the members should take advantage of the rooms provided for them in their present premises in order to interchange views. In olden times there used to be hole-and-corner work among builders, but that had disappeared, and they wanted to meet and consider what wages they should pay their men, and what prices should be given for their work. The Directors had also under consideration the question of insurance, in view of the Employers' Liability Act, and it had been remitted to a Committee to consider whether a federation of the building trades in Scotland, or in Edinburgh, could not be formed for the purpose of insuring themselves against accidents. Sir Thomas Gibson-Carmichael, M.P., Hon. President of the Association, in moving the adoption of the report, said the Exchange had done a great deal to fulfil the ideals with which it started. It was a most useful institution to the trade of Edinburgh, and he trusted it might become of even greater use in the future. Mr. Colin Macandrew seconded the motion, which was unanimously agreed to. Directors were afterwards appointed.

HOME ARTS AND INDUSTRIES ASSOCIATION.—The training classes held by this Association for voluntary teachers and others, at the Royal Albert Hall, have now opened for the autumn session. Bookbinding and leather embossing, carpentry and carving, inlay and marquetry, metal repoussé and basket making, &c., are taught. Particulars can be obtained from the secretary.

NORTHERN COUNTIES' FEDERATED BUILDING TRADE EMPLOYERS.—The quarterly meeting of the Northern Counties' Federation of Building Trade Employers was held at the Royal Hotel, South Shields, on the 27th ult. The President, Mr. Walter Lowry, presided. There was a large attendance of representatives from various parts, who were welcomed by Mr. Shewan, President of the South Shields Association. It was mentioned that the formation of the National Federation of Building Trade Employers was advancing in a most satisfactory manner. It was decided to hold the annual meeting at West Hartlepool in January next. After the meeting the representatives were entertained by the South Shields Master Builders' Association.

SCOTTISH BUILDING TRADES FEDERATION.—The fourth annual meeting of this Federation was held in Edinburgh on the 27th ult., Mr. J. B. Hay, builder, Dundee, President, in the chair. The report of the Executive, which was submitted by the secretary, Mr. James L. Selkirk, Glasgow, set forth the principal matters which had engaged their attention during the year. These included the formation of branches of employers in various towns not already organised, the starting of a monthly trade organ, the forming of a Federation insurance company, and the initiating of a special fund to meet important emergencies that may arise from time to time. The progress of the Federation during the year was regarded as most encouraging, and an earnest desire was expressed that many additional towns and districts would be organised during the next year. Thereafter members of the Executive were elected in room of those retiring, with Mr. James Leslie, contractor, Aberdeen, as President; Messrs. Thomas Kay, wright, Glasgow, and Alexander Beveridge, builder, Perth, Vice-Presidents; and Mr. James L. Selkirk, Glasgow, Secretary and Treasurer.

THE CHRISTINA ROSSETTI MEMORIAL.—On the 1st inst., at Christ Church, Woburn-square, the Bishop of Durham dedicated a memorial to the late Christina Georgina Rossetti, the poet. The memorial consists of a reredos containing paintings of Our Lord and the four Evangelists. The paintings were designed by Sir Edward Burne-Jones and partly executed by him, being completed by his pupil and assistant, Mr. F. Rooke. The reredos itself was designed, it is stated, by the Rev. Glendinning Nash, the vicar.

CAPITAL AND LABOUR.

PETERHEAD MASONS AND THEIR WAGES.—There is a good deal of building going on in Peterhead just now, and those in the mason trade are at present agitating for a rise of wages. The agitation is being conducted through the local branch of the Operative Masons' Society, which was formed fully six months ago, and which now embraces practically all those locally engaged in the trade. The present wages are at the rate of 7d. per hour, and some time ago a demand was made on the masters to increase the wages as from November 1 to 8d. an hour, the same as the standard rate paid in Aberdeen. The masters are understood not to be disposed to give this increase, and have asked an extension of time. A meeting of the operatives' branch was held on the 22nd ult.—Mr. George Milne, President, in the chair—to consider what reply should be given to the masters. It is understood that a motion was made, that a rise to 7½d. should take place on November 1, and a rise to 8d. on February 1. An amendment was, however, moved, that the rise to 8d. should take place on November 1. On a vote, the amendment was carried by a large majority.—*Aberdeen Free Press.*

LEGAL.

AN EXPERT WITNESS AND HIS FEES.

THE case of Hudson v. Miller came before Mr. Justice Ridley in the Queen's Bench Division on the 28th ult., it being an action brought by Mr. Hudson, of Messrs. Wigg, Oliver, & Hudson, surveyors, for 80*l.* 7s., fees alleged to be due for professional services claimed in respect of attendance and evidence given by the plaintiff in the course of litigation between the defendant and the London County Council, which took place in 1895. The defendant's claim in that litigation was in respect of damage done to premises owned by him in Stoke Newington, in consequence of the removal of adjoining buildings by the County Council. The amount claimed was 250*l.*, which was subsequently reduced to 110*l.* The matter was referred to arbitration, and in the result the defendant recovered 17*l.* 10s., with costs on the County Court scale. The defendant's case was that the plaintiff's charges were grossly excessive; and further, that an agreement was made by which the plaintiff consented to identify himself with the claim in respect to the extent of his fees, a minimum of 10*l.* 10s. being guaranteed him.

Mr. Justice Ridley found that no such agreement was made as was alleged by the defendant, but he reduced the claim to 70*l.*

Judgment accordingly.

THE WORKMEN'S COMPENSATION ACT.

AT the Liverpool County Court, on the 26th ult., his Honour Judge Collier gave judgment in an action under the Workmen's Compensation Act. The claimant was Mrs. Lucy Powell on behalf of herself and her three children, and she sought compensation from Messrs. Brown & Backhouse, builders and contractors, Liverpool, for the death of her husband, William Powell, who was a carter in the employ of the defendants. The case was argued before his Honour recently, when several important points were raised as to the construction of the Act. Dr. Thomas was counsel for the applicant, and Mr. Tobin represented the defendants. It had been agreed that if the plaintiff was held to be entitled to recover the amount should be 243*l.* 12s. 7d. The defendants occupied premises which, it was alleged, were a factory within the meaning of the Act, and one question which arose in the case was whether deceased met with his death in the course of his employment on, in, or about the factory. The deceased was engaged in loading timber on to his cart from the defendants' premises, his cart being in the road outside, when he missed his footing and fell from the cart to the ground, sustaining injuries to his spine which resulted in death shortly afterwards. Counsel submitted that the man was in the course of his regular employment when he met with his fatal injury, and also that, if not actually on the factory premises, he was "about" them within the meaning of the Act. Mr. Tobin submitted that it was mere guesswork to say that the accident arose out of the employment, because no one saw the deceased until he had fallen. Counsel suggested that the fall was likely to have been caused by giddiness, in which case, he contended, the defendants were not liable. He argued that the Act did not apply to the deceased's employment, and that the defendants' entire works could not be constituted a factory within the meaning of the Act, though parts of them might come within that definition. The spot where the accident happened, he submitted, was not "in, on, or about" the defendants' premises within the meaning of the Act.—In delivering his reserved judgment, his Honour said he held that the respondents' premises in Chatham-street were a "factory" within the meaning of the Workmen's Compensation Act, 1897. The fall appeared to him purely accidental, and one which the respondents could not have prevented in any way, and for which, but for the Workmen's Compensation Act of 1897, they would not have been liable legally, equitably, logically, or morally; but the question was whether the respondents were liable under the Workmen's Compensation Act, 1897. The accident was clearly not attributable to any "serious or wilful misconduct" of Powell, and therefore the exception mentioned in the Act might be disregarded. He found that the accident arose "out of and in" the course of the employment of Powell, and it therefore remained to be considered whether his employment was one to which the Act applied. Powell, in his view, was clearly employed in a factory, and it did not seem to him to be material that the cart was standing, at the time of the accident, in the street outside the factory. In his view it was covered by the word "about" in section 7, sub-section 1 of the Act. He also thought it would be within the meaning of the word "plant" in a definition of "factory" in the same section, sub-section 2. On the construction of the Act, therefore, he thought that Mrs. Powell was entitled to the compensation she sought, and he would make his award accordingly.

On the application of defendants' counsel, his Honour gave leave to appeal, and granted a stay of execution.—*Liverpool Mercury.*

MEETINGS.

FRIDAY, NOVEMBER 4.

Architectural Association Discussion Section.—Messrs. F. M. Elgood, A. R. Jemmett, and H. V. Lanchester, on "Modern Architectural Tendencies, as Illustrated by Contemporary Work." 7 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Dr. H. R. Kenwood on "Infectious Diseases and Methods of Disinfection." 8 p.m.

Glasgow and West of Scotland Technical College (Architectural Craftsman's Society).—Mr. W. Vicars on "Decorative Stone Work." 8 p.m.

Perth Architectural Association.—Opening address of the session: Mr. Alexander M'Gibbon on "Tradition and Material in Architecture." 8 p.m.

SATURDAY, NOVEMBER 5.

Sanitary Institute (Demonstrations for Sanitary Officers).—Inspection at the Southwark and Vauxhall Water Works, Hampton.

British Institute of Certified Carpenters.—Visit to the "Carlton Hotel." 3 p.m. Meeting at Carpenters' Hall. 6 p.m.

Sanitary Inspectors' Association. — Extraordinary General Meeting. Inaugural address by Mr. T. J. Moss Flower, C.E., Chairman of Council. 6 p.m.

MONDAY, NOVEMBER 7.

Royal Institute of British Architects.—First General Meeting (Ordinary) of the session. Professor Aitchison, R.A., President, will deliver an opening address. 8 p.m.

London Institution.—The Dean of Canterbury (Dr. Farrar) on "Canterbury Cathedral." Illustrated. 5 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Mr. A. S. E. Ackermann on "Principles of Calculating Areas, Cubic Space, &c.; Interpretation of Plans and Sections to Scale." 8 p.m.

Society of Engineers.—Mr. Perry F. Nursey on "The Preparation of Rhea Fibre for Textile Purposes." 7.30 p.m.

Liverpool Architectural Society.—Dr. John W. Hayward on "Construction of Hospitals for Consumptives." 6 p.m.

TUESDAY, NOVEMBER 8.

Northampton Institute, Clerkenwell (Lectures on Architecture).—Mr. F. Bond on "Curvilinear and Flamboyant." 8 p.m.

Institution of Civil Engineers.—Professor W. C. Roberts-Austen on "The Extraction of Nickel." 8 p.m.

Auctioneers' Institute.—Mr. Alexander Macmorran, Q.C., on "The Effect of Recent Decisions on the Liabilities and Rights of Owners in Respect of the Drainage of Buildings."—7.45 p.m.

WEDNESDAY, NOVEMBER 9.

Sanitary Institute (Lectures and Demonstrations for Sanitary Officers).—(1) Inspection at East London Soap Works, Bow, E., 3 p.m. (2) Dr. Joseph Priestley on "Ventilation, Warming, and Lighting." 8 p.m.

THURSDAY, NOVEMBER 10.

Carpenters' Hall, London Wall (Free Lectures on Building and Sanitary Construction.)—Mr. James Bartlett on "Setting Out Work and By-laws." 7.30 p.m.

Institution of Electrical Engineers.—Professor Silvanus P. Thompson, D.Sc., F.R.S., on "Rotary Converters." 8 p.m.

FRIDAY, NOVEMBER 11.

Architectural Association.—Mr. H. Wilson on "Arts and Crafts." 7.30 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Professor Roger Smith on "Sanitary Building Construction." 8 p.m.

SATURDAY, NOVEMBER 12.

Sanitary Institute (Demonstrations for Sanitary Officers).—Inspection at Richmond Main Drainage Works, Mortlake. 3 p.m.

Institution of Junior Engineers.—Visit to the King William-street Station of the City and South London Railway extension works. 3 p.m.

RECENT PATENTS:

ABSTRACTS OF ACCEPTED SPECIFICATIONS.

Open to opposition until December 12.

[1897] 18,246.—MANUFACTURE OF CEMENT: *F. D. Cummer.*—The method consists in mixing with liquid slurry a certain proportion thereof in a dried and pulverised state so as to form a plastic material, containing 36 per

cent. of moisture, which is then subjected to the action of currents of hot air or furnace gases.

20,327.—Gas and Water Taps: *A. W. Cotton and H. Talbot.*—The tap is made in the ordinary form, but is fitted with a small spring and turns on an inclined plane ending in a little notch into which a small tooth attached to the tap is pulled by the spring when the tap is turned off; thus the tap locks itself, and the tooth firmly fixes the tap so that it cannot be turned on until release of the tooth by a slight pull of the tap.

25,599.—Electricity Meters: *Chamberlain & Hookham and S. H. Holden.*—The invention applies to meters wherein the current passes through the armature and through a series coil, which produces or affects the field in which the armature or the brake disc revolves; in order to make such a meter capable of running in the reversed direction when the current is reversed, two series coils are wound in opposite directions over the same or corresponding parts of the meter, and are connected to the meter and the external current, so that the currents in one direction pass through one coil and currents in the other direction pass through the other coil, and thus produce or affect the magnetic field in the same sense; if it is required that the meter shall run more slowly in one direction than in the other, fewer turns can be put on one coil than on the other, or a greater proportion of current can be made to pass through a shunt on entering by one coil; a shunt of higher resistance than is probably required may be permanently soldered to the two ends of the coil, the current being introduced at variable points along the shunt. The latter improvement applies to non-integrating meters, such as ammeters and voltmeters.

26,443.—Earth Closets: *F. Dumay.*—Rollers are applied to the front part of the seat capable of revolving so as to prevent any person from standing on the seat, and the seat turns freely upon a horizontal pivot, actuating, by means of a lever, two slides which normally close the turf-powder box and for a pocket when the seat is depressed to receive a fixed quantity of powder and to discharge the same when the seat rises. In another modification the seat is laterally pivoted on a shaft in a sleeve having two transverse pivots working in fixed bearings and geared to the slides; the earth-box has an indicator consisting of a dial and index actuated by a chain and weight passing over a pulley on the index shaft, and arranged to move a given space on each action of the discharging mechanism.

26,905.—Air-inlets for Drains: *F. T. Grant.*—A pipe or chamber connected below directly or by pipes with the drain is closed at the top by a removable air-tight cover; the chamber has a lateral opening about which is a seating for a self-closing flap, and outside the seating the opening runs into an upwardly extending channel whose bottom is inclined towards the opening; the channel leads above into a rising pipe or chamber at the upper end or part whereof is a grating preferably in one of its side faces; the incline of the channel floor prevents the resting of stones, &c., in front of the flap, and the air-tight cover allows inspection and repair of the flap, as well as inspection and clearing of the interceptor and testing of the drain.

27,397.—Gully and Stench Traps: *J. Johnson, Sarah Johnson, and Elizabeth Jones.*—The gully bottom is formed into an S or P trap to form a seal, and into the trap are arranged a number of branches or waterways disposed around the walls of the gully-trap body which centrally support an open-topped mud receiver that forms a precipitation tank. Access to the S or P trap is afforded by making the bottom of the gully-trap body removable, though under the water-line and sealed, the nose or outlet from the trap or [seal being] higher than the removable bottom.

28,484.—Waterproof and Weatherproof Paint: *H. Loesner.*—To the varnish, or to a drying-oil, dry cement, or cement and silicic acid, are added. After the colour dries, the impervious layer remains, it is claimed, unaffected by air or steam which will penetrate through layers of colour that are not air-tight. A higher degree of hardness is obtained by adding simultaneously silicic acid in the form of sand or quartz, as there are formed layers of silicates "which in time become as hard as stone, and are completely and permanently impervious to air." Over the surfaces to be treated are applied cement, together with varnish. The composition may be made thus:—To from 30 to 40 parts of varnish, or drying-oil, is added a mixture of 40 parts of cement or of 30 parts of cement and 10 of silicic acid, and furthermore, from 20 to 30 parts of colouring material. The novelty lies in the combination of the drying-oil with the cement, the latter being mixed, it may be, with silicic acid, and not in the addition (otherwise useless) to the varnish of a body which in itself is weather-proof. The term "silicic acid" includes compounds commonly comprised under the general term "silica."

[1898] 3,806.—Apparatus for Making and Breaking Electrical Circuits at Predetermined Times: *H. O. Swoboda.*—This comprises a clock or other uniform motor having a revolving dial marked with hours, a fixed pointer for the dial, a pair of arms adjustably fixed on the dial-spindle and revolving with the dial, contact springs fixed in the paths of the arms, electrical circuits connecting a source of electricity through the spindle and the springs to magnets operating a switch; in combination with the magnets is arranged an armature to swing on each side of a vertical line and having a weighted arm loosely connected with the switch blades.

5,118. — Producing Boards, &c., from Round Timber: *A. J. Tenow.*—The log is first split into pieces, which are dried, and then sawn or split into boards. The log is preferably first split lengthwise into two halves by a circular saw, the halves are dried and sawn into thin boards, which are then edge-sawn.

7,578.—Appliances in lieu of Rope for Lashing Scaffolding Poles, Ledgers, &c.: *J. G. Mills & P. Campbell.*—A clip or its equivalent, roughened inside or provided with teeth, is fashioned in two halves to grasp the pole by by being drawn together by nuts and bolts; to this clip is pivotted another, similarly constructed, adapted to grasp another pole, as may be desired; by another arrangement a hinged clip is formed, having at one side a socket for holding one end of the ledger, and fitted with a tightening device, the socket may also be made to receive the bottom of another pole, and underneath the socket is a bracket or arm to bear against the pole's side and strengthen the socket.

9,661.—Breaking-up or Cutting Rocks, Boulders, Stones, or Earth, under Water or on Dry Land: *F. Lobnitz.*—The invention developes that of H. C. Lobintz, No. 14,016 of 1886. The rock-cutter, weighing from 10 tons to 20 tons, is lifted by means of a winch and wire rope and then allowed to fall on to the rock; for subaqueous work the apparatus may be carried by a barge or dredger.

16,222.—Arranging Nails Before Driving Them: *J. W. Brooks.*—The apparatus contains a series of raceways, on which the nails are uniformly stopped, at whose sides is placed a series of pockets for the end-most nails, the nails being transferred therefrom by a transferer which has a series of fingers or projections, one for each raceway, and made movable transversely with respect to the guiding-grooves, the nails on entering the pockets being passed out through tubes or guides. The contrivance is based on sustaining each nail preparatory to its discharge substantially throughout its length in the groove, and then discharging it into a pocket on the side of the groove.

17,173.—Mechanical Door-Checks: *C. F. Hanington.* The device comprises a spring stationary with the pintle, and the second spring having movement coincident with the movable leaf, together with means whereby the springs will engage to elastically check the door when it is closed, but which, when the door rebounds, will allow the springs to clear one another and enable the door to be closed, it being understood that either the check-hinge, or the other hinge, has a closing spring, or that a closing spring is used at the side or top of the door, or that in some manner (apart from the present invention) the door is so arranged as to have a tendency to close.

17,305.—Baths: *C. Walter.*—The invention relates to the use of an open furnace or fire for heating baths. The water is heated by an open gas fire beneath the bath, the hot gases whereof penetrate into a chamber formed at the sides and ends of the bath; or a portable coal fire may be used, and then run into an adjoining compartment or box, whence its heat can be conveyed to the chimney.

17,448.—Gas-heated Soldering Iron: *E. R. Tiburtius.*—On the bent end of the gas-supply pipe is a Bunsen burner, on to the whole-flame tube the bit is screwed, the flame streams out of the tube, and passing over the bit through apertures therein, effects a uniform and constant heating of the iron.

New Applications.

October 17—22.

21,776, Broadbents, Crushing Granite, Quartz, Stones, &c. 21,782, W. H. Bridgwater, Fencing Joints. 21,789, A. Keppelev, Sharpening and Setting Saws. 21,791, H. Ellison, Chemical Drain-Testers. 21,796, W. C. Barns, Window Guard. 21,802, J. F. Child, Water-Level Indicators. 21,827, C. H. West, Impeders, Deflectors, and Heat-Retaining Devices for Heating Tubes, Flues, &c. 21,830, Mathews' Lancashire, Cheshire, and North Wales District White Lead Co. and Others, Lead Oxide and Treatment of Rough Litharge. 21,843, H. C. Hodges, Electrical Safety Fuses. 21,848, S. S. Grove, Wrenches. 21,849, W. Abbott, Machine-made or Moulded Bricks. 21,855, C. M. Hollingsworth, Ornamental Fountains. 21,856, Noble & Allison, Opening Locked Ventilation Doors in Mines Without a Key in Cases of Emergency. 21,860, Vanhauten and Others, Ceilings or Similar Surfaces. 21,861, F. Rough & Co., Friction-Gearing. 21,865, S. O. Cowper-Coles, Zinc Oxide. 21,887, A. H. Mountain, Levelling Staff. 21,889, Campbell & Cameron, Fire-hose Couplings, &c. 21,894, Hutchison & Findlay, Earthenware Pipes. 21,895, G. L. Cumberland, Scraping and Collecting Refuge and Manure on Roads and Streets. 21,901, H. Hürlimann, Weighing Machines. 21,911, J. H. Edwards, Window Fastener. 21,915, A. J. Reynolds, Self-loading Street Cleaning Cars. 21,920, J. C. King, Combusion of Fuel. 21,926, F. W. Kent, Cocks, Valves, &c. 21,932, A. Bardonnex & Co., Moulding Plastic Substances. 21,941, F. J. Beaumont, and 22,027, Northey and Others, Electricity Meters. 21,944, O. D. Lucas, Multiple Electrical Switches. 21,947, Siemens Bros. & Co., & E. Holmes, Electrical Winch for Ash Hoists, &c. 21 950, F. C. Cohart, Window Sashes. 21,951, S. E. Ericson, Valve Cock. 21,952, Furnaces for Burning Household Refuse, &c. 21,953-4, C. Wegener, Refuse Consuming Furnace with Mechanical Transporter. 21,961, W. M. Mordey, Arc Lamps for Projectors. 21,962, P. Luy, Mountlng Pulley Belts. 21,968, Lippincott & Hall, Shelving. 21,969, Leightons, Permutation Locks. 21,977, W. Eisner, and 22,205, L. H. Nash, Water Meters. 21,985, J. H. Kraus, Screwless Casing for Electrical wires. 21,988, Wild & Wight, Conveyer and Elevator Bands. 21,994, Mary E. Scott, Gas Cooking-Stoves. 22,000, F. W. Wentworth-Shields, Bacterial Tanks and Sewage-Filters. 22,015, Fage & Aldridge, Window-Frames and Sashes. 22,017, H. J. Rabone, Spirit Levels. 22,022, P. M. Lehmann, Safety Apparatus for use in Window Cleaning, &c. 22,028, G. Giordano, Flushing Cisterns. 22,035, A. von Hoffmann, Apparatus for use in Working under Water. 22,036, H. H. Bigland; 22,183, Johnson & Wanderlich; and 22,259, F. J. Borland, Arc-Lamps. 22,037, J. Schmidt, Wrapping for Electrical Wire. 22,041, J. C. Sutherland, Gas Meters. 22,056, H. Green, Safety Lamps. 22,059, F. P. Jones, Utilising Waste or other Heat for Drying Bricks, Clay Ware, Cement, Timber, &c. 22,071, J. A. Fleming, Safety Devices for use with Electric Cables. 22,078, Dupuy & Ray, Street Sweeping Machines. 22,023, M. V. Adelberg, Window-cleaner. 22,110, J. Schneeweiss, Acetylene Generator. 22,117, O. Wheeler, "Fire-grates that Warm Fresh Air for Ventilating Purposes." 22,120, Killick & Cochran, Combined Safety Steam Cock and Door Latch. 22,123 and 22,127, F. W. Stoddart, Filters. 22,131, A. C. Creamer, Boundary Fences. 22,141, T. Thomson, Waterproof Compositions for Roof-felts, Panels, Veneers, &c. 22,144, T. N. Robinson, 22,202, J. Anderson, and 22,235, F. H. Keane, Circular-saw Guards. 22,146, J. T. Pearson, Street Watering and Cleansing. 22,146, A. Eadie, Construction of Cupolas, &c. 22,169, L. Carr, Device for Use with Windows. 22,175, G. Daws, Controlling the Position of Fanlights and Pivotted Windows. 22,176, Taylor & Stofer, Tightening and Joining the Strands of Wire Fences, Guy Ropes, &c. 22,181, Highfield & Cater, Electrical Conducting Mains. 22,190, G. Wilkinson, Electrical Joint-boxes and Switches. 22,197, P. Davies, Furnaces and Kilns for Producing Portland Cement, &c. 22,203, Lister & Taylor, Slating or Covering Roofs, &c. 22,211, T. Jolly, Joiner's and Cabinet-maker's Bit. 22,222, F. G. Paynter, Feeding Coops. 22,227, F. W. Smith, Door and Gate Stops. 22,233, G. Heaton, Treatment of Sewage and Impure Waters. 22,240, Eckstein & Shoults, Automatical Electrical Cut-outs. 22,241, W. Tester, "Suspended Roofs with Radiating Ribs." 22,242, G. A. Kiefer, Artificial Stone. 22,262, H. Rigby, Expansion Gear for Bridges, Piers, &c. 22,264, W. G. Dawkins, Method of Preventing a Line, Cord, &c., from Slipping Back when Drawn Taught [sic]. 22,272, A. D. Williamson, Generating, Purifying, Storing, and Distributing Acetylene Gas. 22,277, Müller & Gareis, Automatical Igniters. 22,279, F. G. Maardt, Continuously-operating Kilns.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

October 18.—By R. Waterman & Sons (at Tonbridge).

Tonbridge, Kent.—137, High-st., f., r. 60*l.*	£1,570

October 20.—By Henry Hendriks (at Birmingham).

Sparkhill, Worcester.—62 to 66, Sturge-st., and 69 to 72, Dolphin-rd., u.t. 76½ yrs., g.r. 15*l.* 12s. 6d.	1,410

By Tootell & Son (at Maidstone).

Maidstone, Kent. — Marsham-st., the "Rising Sun" p.-h., f.	780
63, Albion-pl., f.	200

By Skardon, Sons, & Hosking (at Plymouth).

St. Budeaux, Devon.—The Mount Tamar Estate, 16 a., f.	11,250

October 21.—By Vernon & Son (at High Wycombe).

Hughenden, &c., Bucks.—The Prestwood Estate, 452 a. 2 r. 21 p., f.	8,776
Monks Risborough, Bucks.—A Freehold residence, cottage, and 0 a. 1 r. 11 p.	555
A freehold cottage, with workshop and 0 a. 2 r. 16 p.	340
High Wycombe, Bucks. — 8, Frogmoor, with manufacturing and other premises adjoining, f., r. 142*l.* 10s.	3,175
Booker, Bucks.—Great Limmers Farm, 76 a. 2 r. 32 p, f.	1,525

By J. J. Kempley (at Market Weighton).

Market Weighton, Yorks.—The Compact Farm. 73 a. 3 r. 16 p., f.	2,100

October 24.—By David Burnett & Co.

Hammersmith.—58 and 60, Mall-rd., u.t. 69 yrs., g.r. 15*l.* 10s., r. 67*l.*	595

By A. Robertson.

Islington.—142, New North-rd., u.t. 27 yrs., g.r. 6*l.* 6s.	320
Kew.—43, Priory-rd., f., r. 42*l.*	580
Anerley.—Selby-rd., f.g.r. 20*l.*, reversion in 67½ yrs.	585

By Thomas Woods.

Hounslow, Middx.—Staines-rd., two cottages and a fruit plantation, area 3 a., f.	750
New Brentford, Middlesex.—125, 126, and 127, High-st., also Boar's Head-yard, eighteen cottages and a wharf in the rear, f.	5,650
High-st., Bradshaw's Wharf, beneficial lease for 93 yrs., r. 35*l.*, with machinery, &c.	500
Main-rd., Bridge Wharf, beneficial lease for 20 yrs., r. 75*l.*, with goodwill, &c.	420

October 25.—By C. W. Davies.

Stoke Newington.—99, 101, and 103, Prince George-rd., u.t. 94 yrs., g.r. 19*l.* 10s., r. 96*l.*	1,000
Harringay.—27, Warham-rd., u.t. 94¾ yrs., g.r. 6*l.* 10s., e.r. 36*l.*	385
Holloway.—16, Hercules-rd., u.t. 54 yrs., g.r. 5*l.* 5s., r. 30*l.*	275
Highbury.—5, Roseleigh-av., u t. 81 yrs., g.r. 8*l.* 8s., r. 50*l.*	540
Finsbury Pk.—16, Coleridge-rd., u.t. 61 yrs., g.r. 10*l.* 10s., r. 46*l.*	340
Herne Hill.—27, Railton-rd., u.t. 70 yrs., g.r. 6*l.*, r. 30*l.*	340

By Frank Jolly & Co.

Millwall.—52, 54, and 56, Malabar-st., u.t. 61 yrs. g.r. 8*l.*	450
53 and 55, Kerbey-st., and 25, Southill-st., u.t. 55 yrs., g.r. 8*l.* 10s.	450
Haggerston.—40, 42, and 44, Stean-st., u.t. 21 yrs., g.r. 9*l.*	475
Ponder's End.—5, 6 to 20 (even), 21 to 29, 30, 32, and 34, Northampton-rd.; 1 to 11 (odd), Alpha-rd.; and 1, 2, and 3, Suez-rd., u.t. 16 yrs., g.r. 127*l.* 10s.	300

By G. B. Smallpiece.

Stratford.—5, Frederick-st., u.t. 58½ yrs., g.r. 8*l.*, r. 20*l.*	195
232, 236, and 238, High-st., u.t. 65 yrs., g.r. 36*l.*, r. 110*l.*	960
250, 252, 274, and 306, High-st., u.t. 65 yrs, g.r. 57*l.*, r. 180*l.*	1,610

By E. & H. Lumley.

Piccadilly.—C 6, The Albany, f., subject to a fee farm rent of 30*l.*	600

By Debenham, Tewson, & Co.

Sewardstone, Essex.—Yardley House, and 14 a. 3 r. 13 p., f.	2,650
Two enclosures, 11 a. 2 r. 35 p., f.	830
Spencer's Farm, 17 a. 3 r., 14 p., f.	1,550
Manning's (otherwise Yardley) Cottage and 9 a. 3 r. 31 p., f., r. 48*l.*	1,400
A freehold field, 4 a. 2 r. 4 p.	620
Chingford, Essex.—Low-st., two freehold cottages, r. 15*l.*	400
Low-st., Poultry Cottage, c., r. 15*l.*	360
Enclosures of grazing land, 9 a. 1 r. 29 p., f.	450
Walworth.—280, Walworth-rd., c.	620
Clapton.—105, Clifton-rd., u.t. 80 yrs., g.r. 5*l.*	195
Forest Gate.—251, Ramsay-rd., u.t. 81 yrs., g.r. 5*l.* 5s.	185
256, Ramsay-rd., u.t. 83 yrs., g.r. 5*l.* 5s.	200
258, Ramsay-rd., u.t. 81 yrs., g.r. 5*l.* 5s.	200
Bishopsgate-st. Without.—92 to 96 (even), area 4,380 ft., a building lease for 81 yrs., at per annum	400

By Segrave, Browett, & Taylor.

Flitwick, Beds.—The Folly Estate, 22 a. 1 r. 5 p., f. (including chalybeate springs)	2,450

By Messrs. Spelman (at Great Yarmouth).

Great Yarmouth, Norfolk.—South Quay, Crane House, f.	975

October 26.—By Douglas Young & Co.

Highgate.—Shepherd's Hill, The Priory Estate, 15 a. 2 r. 8 p., f.	16,200

By E. Holsworth.

Dalston.—71, 73, and 75, Holly-st., u.t. 18¼ yrs., g.r. 6*l.* 12s.	380

By Harman Bros.

Stoke Newington.—80, Kyverdale-rd., u.t. 82 yrs., g.r. 6*l.* 10s., r. 36*l.*	390
77, Farleigh-rd., u.t. 66 yrs., g.r. 9*l.*, e.r. 48*l.*	440
73, Cazenove-rd., u.t. 75 yrs., g.r. 14*l.*, e.r. 85*l.*	860

By Inman & Co.

Brixton.—Millbrook-rd., i.g.r. 31*l.* 10s., u.t. 24 yrs., g.r. 1*l.* 15s.	440

By E. W. Richardson & Son.

New Southgate.—Rochester-ter., f.g.r.'s 39*l.* 10s., reversion in 67 yrs. (in lots)	1,210

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITIONS.

Nature of Work.	By whom Advertised	Premiums.	Designs to be delivered.
*Public Library	Hull Corp.	50*l.* 30*l.* 20*l.*	Jan. 1, '99
*Fire Brigade Station	Bradford Corp.	100*l.* 50*l.* and 30*l.*	Jan. 2
*Designs for Alterations to Workhouse	Highworth & Swindon Union	Particulars of J. P. Kirby, 42, Cricklade-st. Swindon	No date

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c. Supplied by	Tenders to be delivered.
*Paving Works	Beckenham U.D.C.	J. A. Angell, Council Offices	Nov. 7
*Mason and Iron and Steel Work at Hotel, Edinburgh	Caledonian Ry. Co.	Paddie & Washington Brown, 8, Alleyn-place, Edinburgh	do.
*Road Making and Sewer Works	Willesden D.C.	O. C. Robson, Public Office, Dyne-road, Kilburn, N.W.	Nov. 8
*Road Making and Paving	do.	do.	do.
Town Hall and Offices	Hitchin U.D.C.	E. W. Mountford, Archt. 17, Buckingham-street, Strand, W.C.	do.
Additions to Schools, Crossflatts, Bingley, Yorks.	.....	W. R. Mitus, Archt. Market-st. Bingley	do.
Brewery, Elgin, N.B.	.....	G. Sutherland, Archt. Elgin	do.
School, Pontyberem	Llanelly Sch. Bd.	J. B. Morgan, Archt. New-road, Llanelly	do.
Sewering Streets, Scotts Green	Dudley T. C.	J. Gammage, Boro. Surv. Town Hall	do.
Sewerage Works, Syston, Leicester	Barrow-on-Soar R.D.C.	Simpson & Harvey, Engr. Horsefair-st. Leicester	do.
Laying Telephone Pipes	Manchester Corp.	City Surveyor, Town Hall,	do.
Concrete Landing Works, &c.	Fleetwood U.D.C.	R. T. Hayes, C.E. Town Hall	do.
Waterworks, &c. Humford Mill	Bedlingtonshire U.D.C.	C. D. Forster, Council Offices	do.
Fire Station, Buckingham-street	Dublin Corp.	City Archt. Municipal-bldgs. Cork Hill	do.
Addition to Croft House, Alnmouth	Misses Scott	M. T. Wilson, Archt. Alnwick	Nov. 9
Additions to Inn, Warnham, near Horsham	.....	C. H. Burstow, Archt. 6, West-st. Horsham	do.
Stores, Morley, Yorks.	Indus. Co-op. Soc. Ltd.	G. B. Clegg, Archt. 2, Peel-street, Morley	do.
House, Gordonsburgh, N.B.	.....	J. Perry, Archt. Buckie, N.B.	do.
Troughs, Stalls, &c. Cattle Market, Roath	Cardiff Corp.	W. Harpur, C.E. Town Hall	do.
Additions to Workhouse, Chatham	Medway Union	G. E. Bond, Archt. High-street, Rochester	do.
Schools, Radford	Coventry Sch. Bd.	G. & I. Steane, Archt. 22, Little Park-street, Coventry	do.
Sewerage Works, Loughlinstown, Ireland	Rathdown Union	J. D. Cope, Union Offices, Loughlinstown	do.
Granite Setts (600 tons)	Church (Lancs.) U.D.C.	Surveyor, Council Offices	do.
*Portland Cement	Hackney Vestry	J. Lovegrove, Town Hall, Hackney, N.E.	do.
Cast Iron Pipes, Excavations, &c.	Steyning Water Co.	C. O. Blaber, C.E. Brighton	do.
School, Heybrook	Rochdale Sch. Bd.	T. Townend, jun. Archt. Rochdale	Nov. 10
Banking Premises, Thirsk	Yorks. Banking Co. Ltd.	Bedford & Kitson, Archts. 12, East-parade, Leeds	do.
Cast Iron Pipes and Laying, Hamilton, N.B.	Lanark District Committee	Leslie & Reid, Engrs. 72A, George-st. Edinburgh	do.
Widening Bridge, Clegg-street, Oldham	.....	Engineer, Great Central Railway, London-road, Station, Manchester	do.
*Conservatory, Corporation Park	Blackburn Corp.	W. Stubbs, C.E. Municipal Offices	do.
Kentish Flints (1,200 cubic yards)	Southend-on-Sea Corp.	A. Fidler, C.E. Clarence-road, Southend	do.
House, &c. Llandovery, Wales	.....	D. Jenkins, Archt. Llandilo	do.
Fifteen Houses, Phillip-st. Londonderry	.....	E. J. Toye, Archt. strand, Derry	do.
Street Works	Batley T.C.	O. J. Kirby, Surv. Market-place, Batley	do.
*Well Boring	Hemsford Union	T. J. Sworder, Union Offices, Hertford	Nov. 11
Farm Buildings, Yate Bank, near Blackburn	.....	Sames & Green, Archt. 65, Northgate, Blackburn	do.
Offices, Fire Station, &c.	Altrincham U.D.C.	Hindle & Davenport, Archt. Altrincham	do.
Workhouse Staircase, &c.	Birmingham Union	Mr. Ward, Archt. Paradise-street, Birmingham	do.
Foundry, &c. Keighley	.....	Barber, Hopkinson & Co. Archt. North-st. Keighley	do.
Steel and Iron Bridges, East Harling, &c.	Norfolk C.C.	T. H. B. Heslop, C.E. Norwich	do.
Pumping Station	Coventry Corp.	J. Mansergh, C.E. 5, Victoria-street, S.W.	Nov. 12
Rebuilding White Hart Inn, Exmouth	T. Radford	P. Sherwin, Archt. Manchester-st. Exmouth	do.
Market	Launceston T.C.	O. B. Peter, Archt. Launceston	do.
Paving, Flagging, &c. Thornton-st	Dewsbury Corp.	H. Dearden, Boro. Surv. Town Hall	do.
Drainage Works, Sterry-road, Gowerton	Llangyfelach (Glam.) R.D.C.	J. Thomas, C.E. 32, Fisher-st. Swansea	do.
Water Supply Works, Crosshill	Ayrshire C.C.	D. M. Ross, Surv. Maybole	do.
*Fourteen Shelters at Asylum, Bexley	L.C.C. (Asylums Com.	21, Whitehall-place, S.W.	Nov. 14
*Bridge, Approaches, Road Making, &c.	Executive Committee	Wigg, Oliver, & Hudson, 80, Leman-st. E.	do.
*Bridge Approaches, &c. over Railway	Viscount Eversley Estate Trustees	do.	do.
Alterations, &c. to Schools, Treherbert, Glam.	Ystradyfodwg Sch. Bd.	J. Rees, Archt. Hillside Cottage, Pentre	do.
Post Office, Arbroath, N.B.	Office of Works	Secretary, Storey's Gate, London, S.W.	do.
Offices, Albert-street	Cork Electric Tramway Co. Ltd.	R. Walker, Archt. 17, South Mall, Cork	do.
Additions to Stotfield Hotel, Lossiemouth, N.B.	.....	R. B. Pratt, Archt. County Bank House, Elgin	do.
Road Works	Annfield Plain (Durham) U.D.C.	T. J. Trowsdale, Surv. Council Offices	do.

CONTRACTS—*Continued.*

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c. Supplied by	Tenders to be delivered.
Electric Light Masts	Belfast Harbour Comrs.	W. A. Currie, Harbour Office, Belfast	Nov. 14
Culvert, Embankment, &c. Woodlands Vale Estate, Ryde	General Calthorpe	J. I. Barton, Sur. 1, St. Thomas-st. Ryde	Nov. 15
Fish Market and Offices, Hayes	Cardiff Corp.	W. Harpur, C.E. Town Hall	do.
Sewers, &c.	Hertford Corp.	J. H. Jevons, C.E. Hertford	do.
Guernsey Granite, Kerbing, &c.	Dover T.C.	E. W. Knocker, Castle Hill House, Dover	do.
*Making-up Roads	Tottenham U.D.C.	P. E Murphy, 712, High-road, Tottenham	do.
*Supply and Laying of York Paving	do.	do.	do.
*Surface Water Drainage	Bromley U.D.C.	Surveyor, Council Offices	do.
*Temporary Isolation Hospital	Wood Green U.D.C.	C. J. Guyton, Town Hall, Wood Green, N.	do.
*Kerbing, Tar Paving, &c.	Lewisham Board of Works	Sur. Dept. Board's Offices, Catford, S.E.	do.
*Paving and Making-up Roads	Plumstead Vestry	W. C. Gow, Vestry Hall, Maxey-rd. Plumstead	Nov. 16
Additions to Schools, Holbrook, Suffolk	.....	E. F. Bisshop, Archt. 32, Museum-street, Ipswich	do.
Street Works, Back Streets	Tynemouth R.D.C.	J. Waters, C.E. Long Benton, Tynemouth	do.
Water Supply, Castle Eden Colliery	Easington R.D.C.	D. Balfour & Son, C.E. 3, St. Nicholas-buildings, Newcastle	do.
Waterworks, Eglwysawrw, Cardigan	St. Dogmell's R.D.C.	D. Davies, Council Offices,	do.
Additions to Business Premises Salisbury	Style & Gerrish	F. Batti, Archt. Crown-chmbrs. Salisbury	Nov. 17
Church, St. John's, Driffield, Yorks.	.....	Hicks & Charlewood, Archt. The Vicarage, Driffield	do.
Public Hall, Pitlochry, N.B.	.....	J. Bruce & Son, Archt. Dundee	Nov. 18
Rebuilding Royal Oak Inn, Maryport	Maryport Brewery Ltd.	C. Eaglesfield, Archt. Maryport	do.
Additions to Schools, Barrasford	.....	Armstrong & Knowles, Archt. Newcastle-on-Tyne	do.
Chapel, Armley, Leeds	.....	W. Hanstock & Son, Archt. Branch-rd. Batley	Nov. 19
New Road	Abertillery (Mon.) U.D.C.	J. McBean, Engr. 1, King-st. Abertillery	do.
Protection Works, Beeston Regis and Sheringham	Erpingham R.D.C.	W. Jaffrey, Engr. 3, Victoria-st. Westminster, S.W.	do.
Filters, Subways, &c.	Ashton-under-Lyne Corp.	J. T. Earnshaw, C.E. Town Hall	Nov. 21
School, Pontlottyn	Gelligaer Sch. Bd.	James & Morgan, Archt. Cardiff	do.
*Laundry Receiving Room at Hospital	Metropolitan Asylums Board	A. & C. Harston, 15, Leadenhall-st. E.C.	Nov. 22
*Enlargement of Oldham Post Office	Comrs. H.M. Works	J. Flew, 11, Popplewell-chmbrs. Market-street, Bradford	do.
*Enlargement to School	Bushey S.B.	W. H. Syme, 4, High-st. Watford	Nov. 23
Sewers (20,000 yds.)	East Retford Corp.	J. C. Mellis, C.E. 264, Gresham House, Old Broad-st. E.C.	Nov. 25
Sewerage Works	Thame U.D.C.	Taylor, Sons, & Co. Engrs. 27, Great George-st. S.W.	Nov. 28
Pipe Sewer	Stourbridge Main Drainage Board	W. Fiddian, Surv. Town Hall	do.
School, Rhiwfawr, S. Wales	Llangulcke Sch. Bd.	W. W. Williams, Archt. 63, Wind-st. Swansea	Nov. 30
*Reconstruction of Sanitary Arrangements at Workhouse	Lambeth Gdns.	Offices, Brook-st. Kennington, S.E.	do.
*Additions and Alterations (considerable) to School Premises	Govrs. James Allen's Girls' Schools, Dulwich	A. J. Gale, Serjeants' Inn, Fleet-st.	Dec. 1
*Sewage Disposal	Aylesbury U.D.C.	W. F. Taylor & Sons, Aylesbury	Dec. 17
*Additions to Hospital	Bromley & Beckenham Joint Hospital Bd.	J. Ladds, 7, Doughty-st. Mecklenburgh-sq. W.C.	No date
Residences, Utley	.....	J. Judson & Moore, Archt. Keighley	do.
Three Pairs Cottages, Wakes Colne, Essex	C. P. Wood	J. W. Start, Archt. Colchester	do.
Stores and Stabling, Queen's Bridge, Belfast	Macardle & Co.	W. J. Moore, Archt. Annst. Belfast	do.
Alterations, &c. Shandon Bar, Belfast	J. Jennings	do.	do.
Two Shops, &c. Armside, Kendal	E. Nelson	J. Stalker, Archt. Kendal	do.
Residence, Bradford, Yorks.	.....	J. Jackson, Archt. Barry-st. Bradford	do.
Alterations, &c. Valley Inn, Drighlington, Yorks	.....	A. D. Kaye, Archt. 71, Albion-st. Leeds	do.
Alterations, &c. Sun Inn, Dalton, nr. Ulverston	R. & P. Hartley	Settle & Farmer, Archt. Ulverston	do.
Street Sewers, &c. Eccleshill, Bradford	.....	J. Crawshaw, Surv. Mount View, Eccleshill	do
Roads, Sewers, &c. Downs Estate, Luton	.....	A. R. Bird, The Downs, Luton	do.
Business Premises, Princes-street, Harrogate	J. B. Charles	Blazd & Bown, Archt. Harrogate	do
Workhouse Infirmary	Alcester Union Gdns.	W. H. Ward, Archt. Paradise-st. Birmingham	do
Asphalting Works	Batley Sch. Bd.	J. J. Wilson, Sch. Bd. Offices	do.
Business Premises, High-street, Chesterfield	.....	W. C. Jackson, Archt. Chesterfield	do.
Block of Houses, Falls-road, Belfast	Mrs. M'Ilvenny	W. J. Moore, Archt. Annstreet, Belfast	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in.
*Assistant Sanitary Inspector	Willesden U.D.C.	100*l.* rising to 150*l.* per annum	Nov. 8
*Wharf Superintendent	Southampton Corp.	200*l.* per annum	Nov. 12
*Assistant Surveyor	Wimbledon U.D.C.	200*l.* rising to 250*l.* per annum	Nov. 14
*Superintending Architect	L.C.C.	1,500 per annum	do.
*Manager for Sewage Farm	Longton Corp	150*l.* per annum and residence	Nov. 19
*Clerk of Works	County Boro. of Sunderland	3*l.* 10*s.* per week	Nov. 21

Those marked with an asterisk (*) are advertised in this Number. ***Competitions, p.*** iv. ***Contracts, pp.*** iv. vi. viii. & xxi. ***Public Appointments, pp.*** xviii. xix. & xxi.

By R. Tidey & Son.

Highbury.—107, Highbury New Pk., u.t. 51 yrs., g.r. 6*l.*, e.r. 90*l.* £1,000
De Beauvoir Town.—96, Buckingham-rd., u.t. 26½ yrs., g.r. 5*l.*, e.r. 38*l.* 355

By A. Aldridge & Co.

Shaftesbury Avenue.—2, Denman-st., u.t. 65 yrs., g.r. 50*l.*, e.r. 250*l.* 950

By Wm. Weston (at Paddington).

Bayswater.—211, 213, and 215, Westbourne-grove, u.t. 44 yrs., g.r. 22*l.* 1s., r. 150*l.* 1,540
49, Artesian-rd., u.t. 47½ yrs., g.r. 5*l.*, r. 38*l.* ... 370

By Balch & Balch (at Camden Town).

Kentish Town.—63, Clarence-rd., u.t. 40 yrs., g.r. 5*l.*, r. 36*l.* 345
39, Castle-rd., u.t. 36½ yrs., g.r. 6*l.*, e.r. 40*l.* £345
36, Patshull-rd., u.t. 62 yrs., g.r. 8*l.*, r. 48*l.* 525
6, Alma-st., u.t. 25½ yrs., g.r. 5*l.* 245

By Wood, Furness, & Co. (at Brentford).

Brentford.—100, High-st., f., r. 39*l.* 10s. 800
104, High-st. f., r. 26*l.* 395
The Ham, freehold stabling, r. 20*l.* 12s. 165

By Alfred Richards (at Tottenham).

Tottenham.—5 and 7, Paignton-rd., u.t. 71½ yrs., g.r. 10*l.* 325
23 to 41 (odd), and 41a, Chinton-rd., u.t. 91 yrs., g.r. 44*l.* 1,730
63 to 85 (odd), Shrubbery-rd., u.t. 91 yrs., g.r. 48*l.* 1,630
Shrubbery-rd., &c., two plots of building land, f. 150
68 to 74 (even), Shrubbery-rd., u.t. 91 yrs., g.r. 16*l.* £540
Enfield Highway.—1 to 10, Brimsdown-cottages, u.t. 89½ yrs., g.r. 52*l.* 10s. 800

By Bentley & Sons (at York).

Full Sutton, Yorks.—Freehold farmhouse and 203 a. 2 r. 34 p. 5,600

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard, &c.

PRICES CURRENT OF MATERIALS.

TIMBER.		
Greenheart, B.G. ton	8/0/0	0/0/0
Teak, E.I....load	10/10/0	15/10/0
Sequoia, U.S.ft.cu.	1/9/0	2/0/0
Ash, Canada, load	3/15/0	5/0/0
Birch, do.....	3/10/0	5/10/0
Elm, do.....	4/10/0	5/10/0
Fir, Dantsic, &c..	2/15/0	4/15/0
Oak, do.....	2/2/6	4/2/6
Canada	4/2/6	6/0/0
Pine, Canada red	0/0/0	0/0/0
Do. yellow	4/2/6	6/0/0
Lath, Dantsic,fath	4/10/0	5/10/0
St. Petersburg..	4/0/0	6/10/0
Wainscot, Riga, &c., log.....	4/15/0	6/5/0
Odessa, crown....	4/15/0	6/5/0
Deals, Finland 2nd & 1st std 100	9/5/0	9/15/0
Do. 4th & 3rd ..	9/5/0	9/15/0
Do. Riga	7/15/0	8/15/0
St. Petersburg, 1st yellow	11/5/0	13/15/0
Do. 2nd yellow.	10/5/0	11/15/0
Do. white.....	9/5/0	11/5/0
Swedish	9/5/0	16/5/0
White Sea	10/5/0	17/10/0
Canada, Pine 1st	18/0/0	24/10/0
Do. do. 2nd	13/0/0	16/10/0
Do. do. 3rd, &c.	6/0/0	9/10/0
Do. Spruce, 1st	8/10/0	10/10/0
Do. do. 3rd and 2nd	7/0/0	8/10/0
New Brunswick	7/0/0	8/0/0
Battens all kinds	5/0/0	16/0/0
Flooring boards, sq., 1 in. prep. 1st.....	9/9	16/3
Do. 2nd	c/8/3	0/13/3
Other qualities—	6/6	7/0
Cedar, Cuba, ft.	/4	/4½
Honduras, &c.	/3½	/4½
Mahogany, Cuba	/5½	/7
St. Domingo, cargo av.	/5	0/1/3
Mexican, do. do.	/3½	/4
Tobasco, do. do.	/4	6½
Honduras, do.	/4	/6
Box, Turkey, ton	4/0/0	15/0/0
Rose, Rio	7/0/0	14/0/0
Bahia	6/0 0	12/0/0
Satin, St. Doming.	0/0/5	0/1/0

TIMBER *(continued)*.		
Satin, Porto Rico	0/0/9	0/2/0
Walnut, Italian ..	0/0/3	0/0/7
METALS.		
Iron—Pig, in Scotland .....ton	2/9/6½	0/0/0
Bar, Welsh, in London	6/0/0	6/5/0
Do. do. at works in Wales	5/15/0	5/17/6
Do. Staffordshire, in London.....	6/5/0	7/10/0
COPPER—British cake and ingot	58/1/0	58/15/0
Best selected ..	58/15/0	59/5/0
Sheets, strong..	64/0/0	65/0/0
Chili bars	54 8/9	0/0/0
YELLOW M. L. lb.	5d.	5¾
LEAD — Pig Spanish ....ton	13/12/6	0/0/0
English com. bands	13/15/0	0/0/0
Sheet, English 6 lbs. per sq. ft. and upwards ..	14/17/6	0/0/0
Pipe.....	15/7/6	0/0/0
ZINC — English sheet.....ton	27/5/0	0/0/0
Vieille Montagne	28/5/0	0/0/0
Spelter	24/10/0	24/15/0
TIN—Straits	83/1/3	0/0/0
Australian.....	83/13/9	84/1/3
English Ingots..	85/15/0	86/15/0
Banca	0/0/0	0/0/0
Billiton	c/0/0	2/0/0
OILS.		
Linseed .....ton	17/17,6	0/0/0
Cocoanut, Cochin	27/15/0	0/0/0
Do. Ceylon	24/10/0	0/0/0
Palm, Lagos	21/15/0	0/0/0
Rapeseed, English pale	24/0/0	0/0/0
Do. Brown	22/10/0	0/0/0
Cottonseed ref. ..	15/0/0	16/0/0
Oleine.....	17/0/0	18/0/0
Lubricating U.S.	0/5/3	0/7/6
Do. Black	0/5/0	0/6/6
TAR — Stockholm barrel	1/5/0	0/0/0
Archangel.....	0/18/0	0/0/0
Turpentine	26/15/0	27/0/0

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than 10 a.m. on Thursdays.* N.B.—We cannot publish Tenders unless authenticated by the name and address of the sender; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is given, nor any list in which the lowest Tender is under £100 unless in some exceptional cases and for special reasons.]

BELFAST.—Accepted for the construction of a covered concrete reservoir at the Horseshoe. Ballysillan. Mr. Acheson Ferguson, surveyor, 35, Royal-avenue, Belfast:—
Jacob W. Lester, Milewater-road, Belfast.....£9,358

BERKHAMSTED.—Accepted for alterations and additions to premises, High-street, Berkhamsted, for Messrs. Ind, Coope, & Co., Ltd. Messrs. Harrington & Ley, architects, 108, Fenchurch-street, E.C.:—
H. & J. Matthews, Berkhamsted £364 1 6

BO'NESS, N.B.—Accepted for the execution of street works within the burgh, for Bo'ness Police Commissioners. Mr. J. P. Lawrie, Burgh Surveyor, Burgh Chambers, Bo'ness. Quantities by the surveyor:—
The Bowden Lime Company, Bo'ness £315 18 6
Tar Macadam.
W. G. Walker & Sons, 35, Frederick-street, Edinburgh..... 99 9 9

BURTON-ON-TRENT.—For erection of house at Winshill, for Mr. J. R. Ewers. Mr. Thomas Jenkins, architect, 35, High-street, Burton-on-Trent:—

Bottrill & Alvey .....£	439 5	R. Kershaw .....£	385 0
G. Parker	403 0	G. Kennard*	362 10
Harlow & Wallis.....	391 0	* Accepted.	

BURTON-ON-TRENT.—For alterations to shop in High-street for Messrs. Bindleys, Limited. Mr. Thomas Jenkins, architect, 35, High-street, Burton-on-Trent. Quantities by the architect:—
H. Edwards (accepted with additions) £300

BURTON-ON-TRENT.—Accepted for erection of house at Swadlincote, for Mr. Norman E. Cooke. Mr. Thomas Jenkins, architect, 35, High-street, Burton-on-Trent. Quantities by the architect:—
Ed. Chamberlain £562

BURTON-ON-TRENT. — Accepted for block of stables at Victoria-crescent, for Mr. Charles Swain. Mr. Thomas Jenkins, architect, 35, High-street, Burton-on-Trent:—
Harlow & Wallis £350

BURTON-ON-TRENT. — Accepted for addition to shop at Winshill, for the Burton-on-Trent Co-operative Society, Limited. Mr. Thomas Jenkins, architect, 35, High-street, Burton-on-Trent:—
A. Geary £151 19 6

CARLISLE.—For the erection of a lodge, the Sauceries, for the Corporation. Mr. H. C. Marks, C.E., 36, Fisher-street, Carlisle, Quantittes by City Surveyor:—

Beaty Bros. .....£	741 0 0	E. J. Hill .....£	679 0 0
R. Little	721 17 0	G. Hill & Sons	667 16 9
W. Lattimer	684 0 0	J. Laing, Denton-	
J. H. Reed	699 10 0	street* (accepted) ..	654 12 2
[All of Carlisle.]			

[Surveyor's estimate, £646 18s. 7d.]

CHELMSFORD.—For the erection of small detached residence, Cottage-place. Mr. George E. Clare, architect, Chelmsford:—

W. Samms .....£	520	E. West .....£	500
Choat & Son	510	F. Johnson (accepted).....	494
[All of Chelmsford].			

CULTER (Aberdeen).—Accepted for the erection of villa at Culter, for Mr. W. Copland Beattie. Messrs Beattie & Macdonald, architects:—
Masonry.—Edgar Gauld, Gilcomston-place Aberdeen £885 0
Carpentry.—R. Thomson & Sons, Stonehaven 730 0
Slating.—George Farquhar, Union-row, Aberdeen 198 0
Plastering.—J. Bannochie & Sons, Belmont-street, Aberdeen 195 16
Pumbing.—Thom & Strachan, Windmill Brae, Aberdeen 188 16
Painting.—J. & S. Fyfe, 11, Dee-street, Aberdeen.. 57 10
Total..... £2,225 2

COBHAM.—For alterations and additions to the brewery at Cobham, for Messrs. Ashby's Cobham Brewery Company, Limited. Messrs. Treadwell & Martin, architects, 2, Waterloo-place, S.W. Quantities by Mr. H. Williams Mellor, 17, Buckingham-street, Adelphi, W.C.:—

Peters & Son .....£	2,920	Smith .....£	2,700
Cropley.....	2,785	Wood	2,398
Gower	2,757	James	2,370

HARROW-ON-THE-HILL.—Accepted for making-up Byron, Valentine, and Kingsfield-roads, for the Urban District Council. Mr. T. Charles, surveyor, Council Offices, High-street, Harrow. Quantities by surveyor:—
G. Wimpey & Co., Hammersmith, W.....£1,214 0 7

LEE.—For erecting a sorting office, Lee, for the Commissioners of H.M. Works Public Buildings:—

Thomas & Edge.....£	2,297	T. J. Barden.....£	2,050
W. H. Lorden & Son	2,222	Merredew & Wort	1,970
Balaam Bros.	2 2 0	General Builders, Ltd.* ..	1,950
W. Martin.....	2,164	* Accepted.	

LITTLEHAMPTON.—For the erection of the Connaught-road boys' school, for the Littlehampton School Board. Mr. Gordon P. G. Hills, architect, 4, Adam-street, Adelphi, London. Quantities by Mr. C. A. Bassett-Smith, 10, John-street, Adelphi, London:—

Longley & Co. .....£	4,863	Linfield & Son .....£	4,050
W. Wallis	4,597	Snewin Bros*	4,015
A. Burrell	4,527	* Accepted.	

LONDON.—For the erection of twelve cottages, Winchmore Hill, N., for the Southgate Urban District Council:—

J. Chessum & Sons....£	4,681 0	C. Collins.....£	3,036 0
Heirons & Smith.....	3,823 10	T. W. Brown	2,937 0
H. Wood	3,739 0	J. Willmott & Sons....	2,935 12
C. J. Newby Bros.....	3,386 0	Alf. Cohen	2,770 0
Jennings & Grenfell ..	3,042 0		

LONDON.—For alterations and additions to Edinburgh House, Kilburn, W., for Mr. R. Beardall. Messrs. Treadwell & Martin, architects, 2, Waterloo-place, S.W. Quantities by Mr. H. Williams Mellor, 17, Buckingham-street, Adelphi, W.C.:—

McBain .....£	3,034 0	Melbourne .....£	2,821 0
Scrivener & Co.	2,974 0	Lole & Lightfoot.....	2,801 10
Styles & Sons	2,876 0		

LONDON.—Accepted for the erection of a block of flats at Franklin's-row, to be known as "Burton Court," for Mr. A. J. Sanderson. Mr. Paul Hoffman, architect, 152, Palmerston-buildings, Old Broad-street, E.C. Quantities by Mr. H. Williams Mellor, 17, Buckingham-street, Adelphi, W.C.:—
T. Britton £26,103

LONDON.—For new internal fittings to the "Old Shades" Tavern, Charing Cross, for Messrs. Anstiss & Buckler. Messrs. Treadwell & Martin, architects, 2, Waterloo-place, S.W. Quantities by Mr. H. Williams Mellor, 17, Buckingham-street, Adelphi, W.C.:—

Antill & Co. .....£	3,392	Wright & Co. .....£	3,084
Ashby Bros	3,285	F. & H. F. Higgs	2,994
Atkinson & Co.....	3,136	Waring & Sons	2,983

LONDON.—For the entire redrainage and new sanitary work and fittings to the Aschway-road Infirmary, Highgate, N., for the Guardians of the Poor of the Holborn Union. Mr. H. Williams Mellor, surveyor, 17, Buckingham-street, Adelphi, W.C.:—
Adams..... 37½ per cent, in excess of the prime cost of the priced schedule of prices.

Finch & Co.....	35 per cent.	do.	do.
Shurmur.....	33⅓ per cent.	do.	do.
Barrett & Power	25 per cent.	do.	do.
Minter	17½ per cent.	do.	do.
Keason	17½ per cent.	do.	do.
H. Wall & Co...	15 per cent.	do.	do.

LONDON.—For the rebuilding of Nos. 61 and 62, Houndsditch, E.C., for Mr. J. Farquharson. Mr. G. Sparks, architect. Quantities by Mr. H. Williams Mellor, 17, Buckingham-street, Adelphi, W.C.:—

Patman & Fotheringham £	2,913	Ashby Bros.....£	2,705
Ashby & Horner	2,841	Killby & Gayford	2,625
Lole & Lightfoot	2,798	McCormick & Sons.....	2,596

LONDON.—For the erection of stabling, ham and bacon stores, caretaker's house, &c., at Gravel-lane, E.C., for Mr. J. Sainsbury. Mr. Ernest Carritt, architect, 57, Lincoln's Inn-fields, W.C. Quantities by Mr. H. Williams Mellor, 17, Buckingham-street, Adelphi, W.C.:—

Wm. Johnson & Co. ... £	11,830	F. & H. F. Higgs.....£	11,515
Beer & Gash	11,807	Patman & Fotheringham	11,496
Ashby Bros.....	11,640	Rider & Son	11,495
Hunt & Son	11,593	Smith & Sons.....	11,079

LONDON.—For the erection of an underground convenience at Old-street, City-road, for the St. Luke's Vestry, Middlesex. Mr. Harley Heckford, C.E., Vestry Surveyor. Quantities by Mr. H. Williams Mellor, 17, Buckingham-street, Adelphi, W.C.:—

Finch & Co.....£	2,895	Jennings.....£	2,498
Shurmur.....	2,772	Davies	2,375

LONDON.—For the erection of "Glenthorne," The Bishop's-avenue, Finchley, N., for Mr. J. Sainsbury. Mr. Ernest Carritt, architect, 57, Lincoln's Inn-fields. Quantities by Mr. H. Williams Mellor, 17, Buckingham-street, Adelphi, W.C.:—

Ashby Bros.....£	4,963	McCormick & Sons .....£	4,484
Brown & Co.	4,784	Grover & Son	4,471
Johnson & Co.....	4,538		

LONDON.—Accepted for alterations to adjoining buildings in order to provide forty-two additional bedrooms to Hampden Residential Club, for Hampden House, Limited. Messrs. Salter, Issott, & Salter, architects, Phœnix-street, St. Pancras, N.W.:—
J. S. Elmore, Brixton £305 10
Electric Light Fittings.
C. J. Smith, King-street, Regent-street 90 0

LONDON.—For the construction of new road and sewer through land adjoining the "Pigeons" public-house, Romford-road, Stratford, E., for Messrs. Savul Bros., Limited. Mr. Henry Poston, surveyor, 39, Lombard-street:—

John Mowlem & Co.....£	1,378	Geo. Bell .....£	1,011
Thomas Adams	1,098	John Jackson*	1,035
G. E. Todd & Co.....	1,069	* Accepted.	

LONDON.—For alterations and additions to the "Coach and Horses" public house, High-road, Leyton, E., for Mr. Harry Johnson. Mr. Henry Poston, architect, 39, Lombard-street:—

Brown & Kruse.....£	705	G. E. Todd & Co.* .....£	659
Trent Bros.	673	* Accepted.	

LONDON.—For alterations and additions to the "King's Head" public house, Broadway, Stratford, E., for Mr. Percy Briggs. Mr. Henry Poston, architect, 39, Lombard-street:—

Trent Bros. .....£	1,437	G. E. Todd & Co.* .....£	1,375
Brown & Kruse	1,423	* Accepted.	

LONDON.—For the erection of an underground convenience in Golden-lane, E.C., for the St. Luke's Vestry, Middlesex. Mr. Harley Heckford, Vestry Surveyor. Quantities by Mr. H. Williams Mellor, 17, Buckingham-street, Adelphi, W.C.:—

Doulton & Co.....£	2,902 0	Thomas & Edge .....£	2,751 0
Mowlem & Co.....	2,858 0	Wood	2,745 0
Jennings	2,790 0	Finch & Co.	2,585 0
Shurmur	2,772 0	General Builders, Ltd.	2,550 0
Bull	2,767 10		

LONDON.—For internal and external painting works and sundry repairs at the Norwood Public Library, South Norwood. Mr. Sidney R. J. Smith, architect:—

Langton Todd .....£	249 0 0	General Builders, Ltd. £	120 0 0
E. T. Folley	127 17 0	B. E. Nightingale	98 10 0
W. Hornett.....	125 8 0	E. Petty.....	95 0 0
T. Hewett	119 10 0	B. Bristowe	89 5 0
W. Hobbs	119 0 0	Lever & Sons.....	82 0 0
Waring & Sons.....	109 4 0	F. W. Harris	77 0 0
Woolaston Bros.	108 0 0	Buckeridge Bros., Kensington*	73 0 0
Vigor & Co.	107 10 0	Drew, Swanston, & Co.	70 4 6
J. Dorking & Sons ..	107 0 0		
* Accepted.			

LONDON.—For internal and external painting works and sundry repairs at the Tate Library, South Lambeth. Mr. Sidney R. J. Smith, architect:—

Langton Todd .....£	624 0 0	Bragg & Sons.....	279 0 0
Huckin	460 11 0	J. Crossley	261 0 0
J. Dorking & Sons ..	450 0 0	B. E. Nightingale	257 0 0
H. J. Bartlett	391 0 0	T. Emmett	227 10 0
W. Hornett	371 0 0	F. W. Harris	219 0 0
De Jong & Co.	370 0 0	Woolaston Bros.....	216 0 0
E. J. Folley.....	346 0 0	Drew, Swanston, & Co.	206 3 6
Waring & Sons	344 0 0	Buckeridge Bros., Kensington*.....	189 0 0
T. Lapthorne & Co.	339 0 0	T. Hewett	153 10 0
Graham & Banks	337 0 0	* Accepted.	
General Builders, Ltd.	290 0 0		
Vigor & Co.	284 0 0		

LONDON.—For internal and external painting works and sundry repairs at the Durning Library, South Lambeth. Mr. Sidney R. J. Smith, architect:—

Langton Todd .....£	595 0 0	B. E. Nightingale....£	364 0 0
W. Hornett	366 0 0	Drew, Swanston, & Co.	252 9 6
H. J. Bartlett	355 0 0	Waring & Sons	232 0 0
J. Dorking & Sons ..	345 0 0	Woolaston Bros.	220 0 0
E. J. Folley	316 0 0	F. W. Harris	220 0 0
General Builders, Ltd.	300 0 0	T. Emmett	207 10 0
Bragg & Sons.....	298 0 0	Buckeridge Bros., Kensington*.....	195 0 0
Vigor & Co.....	297 0 0	T. Hewitt	140 0 0
J. Crossley	289 0 0	* Accepted.	
T. Lapthorne & Co...	287 0 0		

LONDON.—For the erection of a laundry at Gertrude-street, Fulham, for the Guardians of the Poor of the St. George's (Hanover-square) Union. Mr. Edwin T. Hall, architect, 57, Moorgate-street, E.C.:—

John Allen & Son .....£	11,250	General Builders .....£	10,700
Bulled & Co.....	11,221	Marriage & Co.....	10,300
George Wade	10,996	Lole & Lightfoot	10,231
Barrett & Power.....	10,986	Spencer Santo & Co.	9,961
Foster & Dicksee	10,888	Pattinson & Son	9,628
F. T. Chinchen	10,800	Balaam Bros.	9,539
H. Wall & Co.	10,733	C. Gray Hill (accepted) ..	9,275

LONDON. — Accepted for alterations and fittings, No. 137, Cheapside, for Messrs. Cave & Benoist. Mr. G. Gordon Stanham, architect, 102B, Queen Victoria-street, E.C.:—
John Appleby, Cornwall-road, S.E.....£550

LONDON.—Accepted for alterations and painting at Oak Hill House, Hampstead:—
General Builders, Limited £295

LONDON.—For repairs, alterations, and additions to No. 55, Bernard-street, Russell-square, W.C. Mr. Oscar Hall, architect:—

Holliday & Greenwood..£	977 10	Kirby .....£	875 0
Lawrence	958 0	E. Houghton & Son	714 0
Clarke & Mannock.....	887 0	Williams & Camall.....	680 0

NEWTON FERRERS (Devon).—For the erection of a villa, River Yealm Building Estate, Newton Ferrers, Devon. Mr. J. Ford, C.E., 1, George-street, Plymouth:—
J. Paynter, Plymouth.....£832 15 0

RAMSGATE.—Accepted for the erection of a refuse destructor and other buildings, for the Town Council. Mr. T. G. Taylor, Borough Surveyor, Broad-street, Ramsgate:—
Horsfall Furnace Syndicate, Ltd., Park-lane, Leeds £7,245

RUTHIN.—Accepted for additions, &c., to house, Brynhyfryd, and erection of schools, for the Governors of the County School for Girls. Mr. Jas. Hughes, architect, Denbigh:—
W. Wheeler, Denbigh £1,125
[Architect's estimate, £1,285.]

SALTBURN.—For the erection of stone bridge. Mr. Walker Stead, C.E., County Surveyor, Northallerton:—

Thos. Dickinson....£	2,200 0 0	W. Blackburn .....£	1,167 17 3
Jos. Bentley	1,500 0 0	A. Atkinson & Co., Yarm-road, Stockton (accepted)	935 0 3
P. O. Hetherington	1,353 10 0		
Chas. Firth	1,250 0 0		

SOUTH SHIELDS. — For the erection of new laundry, mortuary, and alterations to the Ingham Infirmary, South Shields. Mr. Henry Grieves, architect, Albany-chambers, South Shields:—

S. Sheriff .....£	1,704 0 0	Crighton Bros.,	
James Young	1,655 3 8	South Shields*....£	1,618 0 0
* Accepted.			

STONY STRATFORD.—For the execution of road works, Wolverton-roads, for the Rural District Council. Mr. J. Eunsons, C.E., of Northampton, Engineer to the District Council:—

Wm. Heap .....£	1,035 2 0	T. P. Robinson, Wol-	
Wilson & Martin ..	881 0 0	verton (accepted) ..£	828 13 8

LONDON.—For the erection of a new workhouse at Grove Park, Greenwich. Mr. T. Dinwiddy, architect, 5, Whitehall, S.W Quantities by Mr. Jacob:—

—	—	Deduct		Add
		Oak Fence.	Tisbury Stone.	Brickwork in Cement.
	£	£	£	£
Cubitt & Co.	198,520	990	—	4,900
Foster & Dicksee	203,503	881	—	4,840
H. L. Holloway	192,000	678	250	3,774
C. Gray Hill.	193,200	Not stated.	Not stated.	3,900
Killby & Gayford	201,410	900	109	4,860
Kirk & Randall	189,137	915	—	4,786
Leslie & Co.	204,640	980	—	5,120
B. E. Nightingale	199,853	1,150	215	4,112
Pattinson & Son	184,282	705	510	4,467
T. Rowbotham	175,020	883	740	3,338
Wm. Shepherd	199,320	850	151	4,900
C. Wall	192,788	700	235	3,850
Wallis & Sons	187,800	712	1,036	3,386
J. J. Wise	194,000	521	523	3,840

SWADLINCOTE.—For erection of shops and bakery at High-street, for Mr. B. Goodhead. (Ovens not included.) Mr. Thomas Jenkins, architect, 35, High-street, Burton-on-Trent. Quantities by the architect :—

Lowe & Sons	£1,360	H. Edwards	£1,252
E. Clarke	1,250	R. Kershaw*	1,202
G. Hodges	1,250		

* Accepted.

TAVISTOCK.—For the execution of drainage works, Yelverton Mr. Geo. D. Bellamy, C.E., 6A, Courtenay-street, Plymouth :—

G. Shellabear & Son	£2,111 0 0	E. Duke	£1,565 5 3
A. Andrews	1,935 0 0	W. B. Berry	1,511 15 0
P. Blowey	1,890 0 0	J. Fisher	1,466 17 9
J. Shaddock	1,795 15 9	W. C. Shaddock, Hillsborough, Plymouth (accepted)	1,422 1 1
Wm. Gibson	1,737 0 0		
H. Smith & Son	1,614 15 0		

TOTTERIDGE (Herts).—Accepted for the erection of a bridge, and other works in connexion therewith, over the Totteridge Ford, for the Hertford County Council. Mr. Urban A. Smith, County Surveyor, 41, Parliament-street, Westminster, S.W. :—

Geo. Bell, Tottenham £564

WALLINGFORD.—For the superstructure of new buildings at the Berkshire Asylum, near Wallingford. Mr. George T. Hine, architect, Westminster. Quantities by Mr. L. A. Francis :—

R. Curtis	£29,966 5 0	W. Pattinson & Sons	£24,401 0 0
H. Lovatt	29,376 19 9	J. Parnell & Son, Pennington-street, Rugby*	24,056 0 0
T. H. Kingerlee & Sons	26,392 0 0		
Benfield & Loxley	25,694 0 0		
McCarthy E. Fitt	25,394 0 0		

* Accepted.

WANSTEAD (Essex).—For the erection of a school (one story) and a caretaker's cottage on the Cobbold-road site, for the Wanstead School Board. Mr. John T. Bressey, architect, 70 and 71, Bishopsgate-street Within, E.C. :—

H. R. Rons	£10,885	William Smith & Son	£10,255
Walter Lawrence	10,805	J. V. Kiddle & Son	10,053
James Smith & Sons	10,637	F. J. Coxhead	9,924
Harris & Wardrop	10,597	James Catley	9,498
S. J. Scott	10,570	Alfred Reed & Son	9,418

WEYBRIDGE.—For the erection of convent of the Infant Jesus, for the Dames de St. Maur. M. de H. Duval, architect, 10, Gleneldon-road, Streatham. Quantities by Messrs. Thompson & Waller, surveyors, 20, Glasshouse-street, Piccadilly-circus :—

Patman & Fotheringham	£7,743	Otway	£7,010
Brown & Son	7,630	Watson	6,990
Nightingale	7,493	Greenfield	6,985
Badcox & Maxey	7,120		

WINDSOR.—For the erection of a residence and stabling, Bolton-road, Windsor, for Mr. A. W. Benyon. Messrs. Edgington & Summerhill, architects, Windsor :—

W. Satchwell, Egham £4,000

[Amended estimate.]

WINDSOR.—For new entrance gateway to the "White Hart" Hotel, Windsor, for Mr. J. C. Lake. Messrs. Treadwell & Martin, architects, 2, Waterloo-place, S.W. Quantities by Mr. H. Williams Mellor, 17, Buckingham-street, Adelphi, W.C. :—

Watson, Ascot £625

WINDSOR FOREST.—For the erection of a billiard room, Cranborne Hall, for Mr. James Foster. Mr. A. Henley Attwater, architect, 16, Craven-street, W.C. :—

W. Satchwell Egham £250

[No competition.]

LONDON SCHOOL BOARD TENDERS.

At the last meeting of the London School Board, the Works Committee submitted the following lists of tenders :—

BETTS-STREET.—Refitting boys and female infants' offices, rearranging and refitting male infants' offices, erecting girls' offices in new position on roof playground, and new drainage scheme :—

W. Gregar & Son	£2,734 0	E. Lawrance & Sons	£2,382 0
G. Munday & Sons	2,680 0	L. H. & R. Roberts	2,197 0
G. S. S. Williams & Son	2,513 0	Johnson & Co.	2,089 0
Dove Bros.	2,495 0	H. Knight & Son	2,022 10
E. Parsons & Co.	2,490 0	E. Triggs*	1,995 0

SURREY-LANE.—Erecting deaf centre for boys and girls (48), providing water-closets and covered playground, and enclosing, draining, and tar-paving the additional land :—

F. & H. F. Higgs	£4,987	O. Craske	£3,772
J. Carmichael	4,108	W. Downs	3,647
J. Garrett & Son	4,086	W. Johnson & Co., Ltd.	3,632
J. & M. Patrick	3,848	Lathey Bros.	3,583
E. Triggs	3,823	J. Marsland	3,563
T. Gregory & Co.	3,810	B. E. Nightingale*	3,448

GLOUCESTER-ROAD.—Erecting special school :—

J. N. Try	£4,200	J. Garrett & Son	£3,385
Holliday & Greenwood	3,762	Edwards & Medway	3,312
E. P. Bulled & Co.	3,746	W. Johnson & Co., Ltd.	3,123
J. Smith & Sons	3,667	E. Triggs	3,094
F. & H. F. Higgs	3,500	J. & C. Bowyer*	2,925
A. White & Co.	3,457		

VALLEY-ROAD.—Removing three iron buildings and appurtenances from the Cavendish-road site, and re-erecting two of the buildings and appurtenances upon this site, and stacking the third building :—

T. Cruwys	£1,065		£250†
Humphreys, Limited	1,062		231†
J. Mitson & Co.	1,059		198†
W. Harbrow	1,037		125†
J. & W. T. Hunter*	920		75†

* Recommended for acceptance.
† Amount to be added for re-erecting the third iron building if required.

WHITE LION-STREET.—Enlargement — Boys, 104; girls, 111; infants, 133; total, 348. Providing halls for all departments; removing existing and providing new staircases and cloak-rooms for boys and girls; teachers' rooms and lavatories for all departments; re-seating, stepping and improving lighting of existing class-rooms; providing playground on roof of new enlargement for girls; providing new water-closets for all departments; removing present schoolkeeper's house and leaving one existing house on site for use of schoolkeeper; providing new drainage scheme, and enclosing and tar-paving the additional land :—

G. Munday & Sons	£16,832	E. Triggs	£16,135
F. & F. J. Wood	16,495	T. L. Green	16,025
G. S. S. Williams & Son	16,480	L. H. & R. Roberts	15,529
J. Chessum & Sons	16,382	E. Lawrance & Sons*	15,312
J. Grover & Son	16,286		

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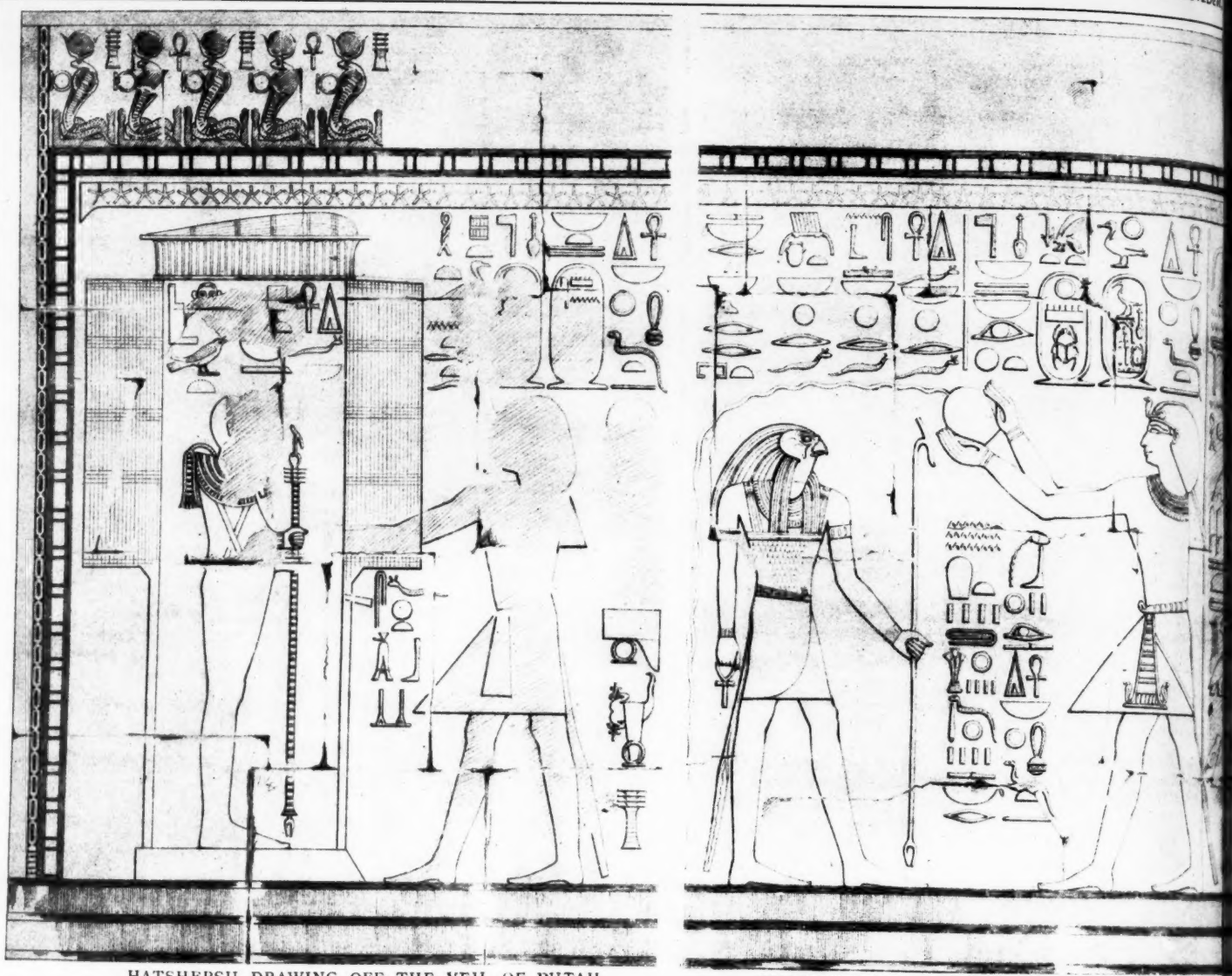
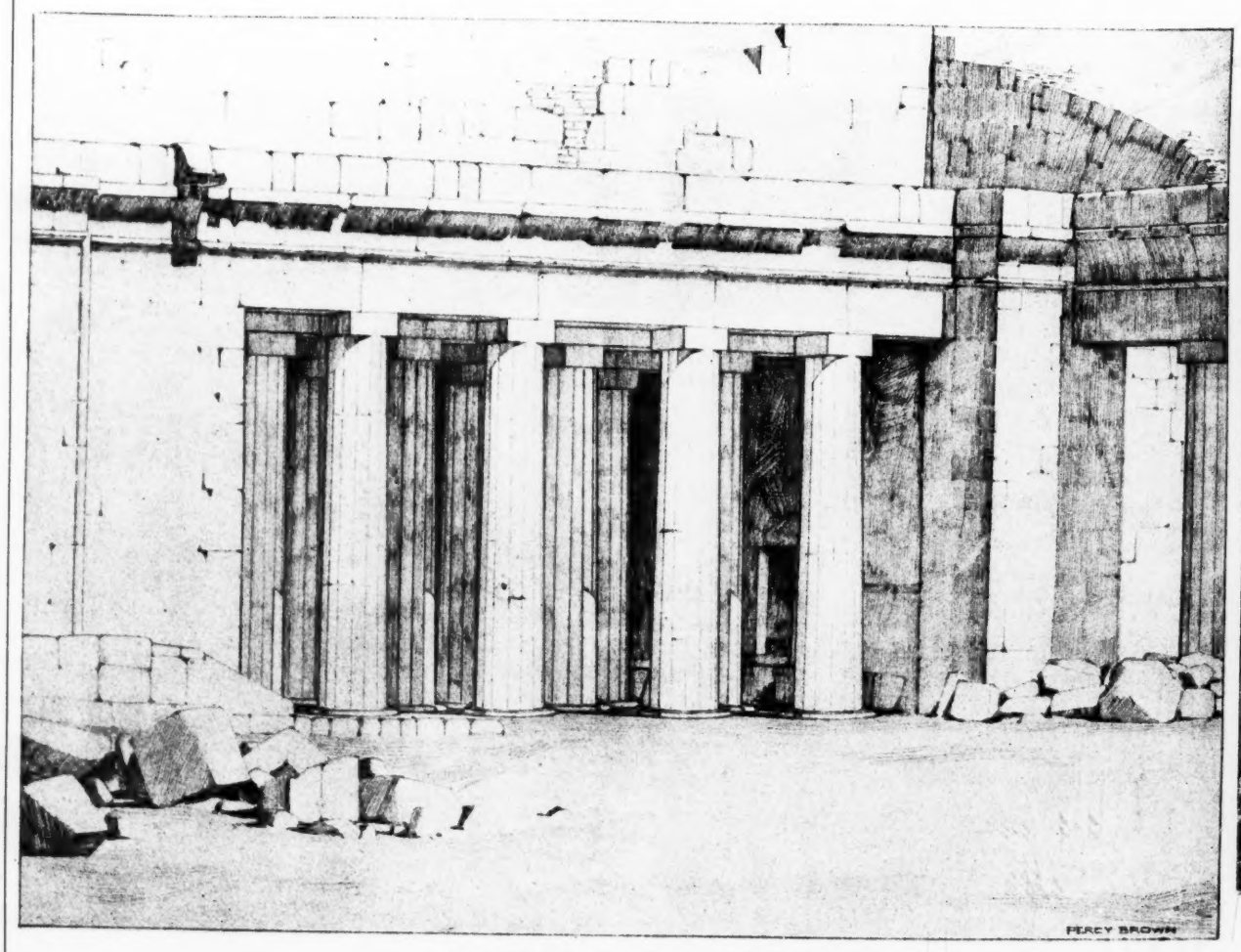


HATSHEPSU DRAWING OFF THE VEIL OF PHTAH.

THOTHMES III OFFERING WATER TO SOKARIS.

PAINTINGS IN THE SHRINE OF ANUBIS.



VIEW OF THE SHRINE OF ANUBIS.

BAS-RELIEFS OF

DEIR-EL-BAHARI: ILLUSTRATIONS TO MR. NEWBERRY'S PA

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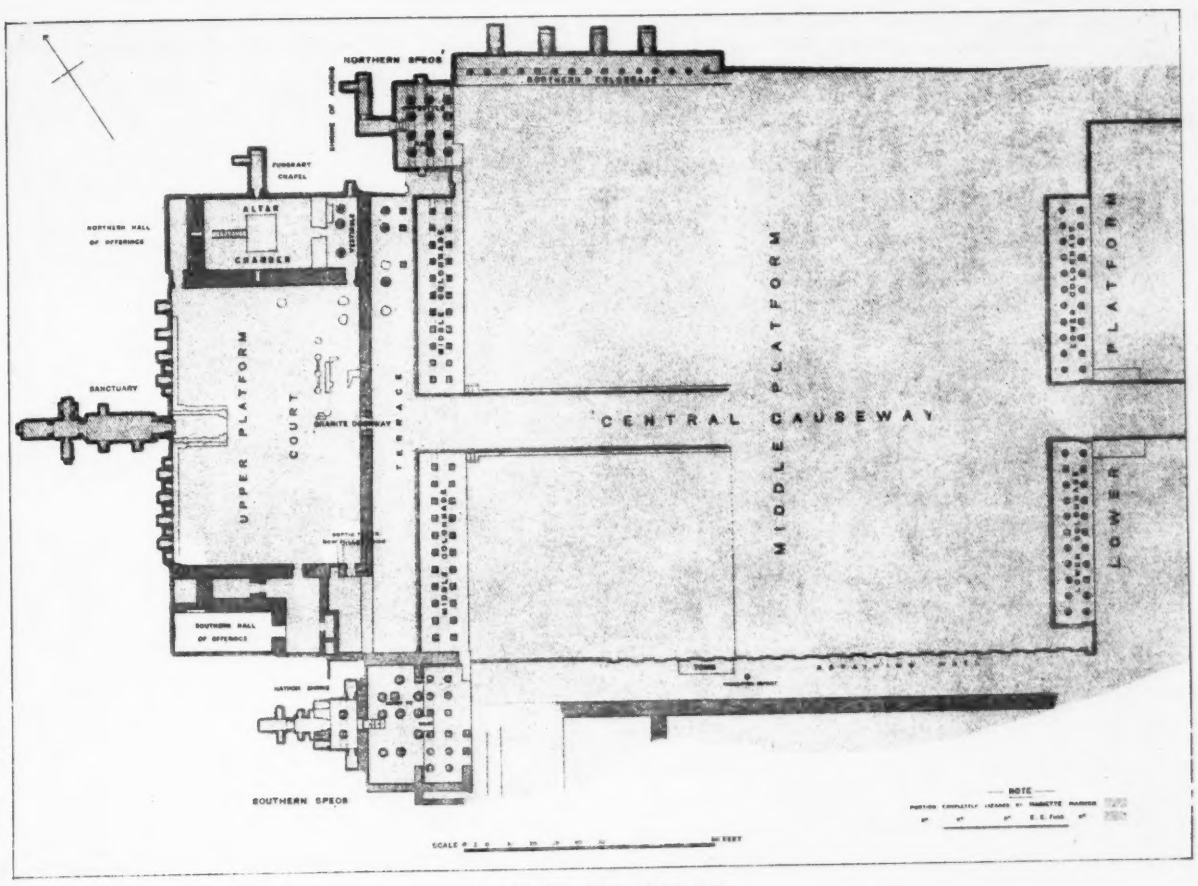
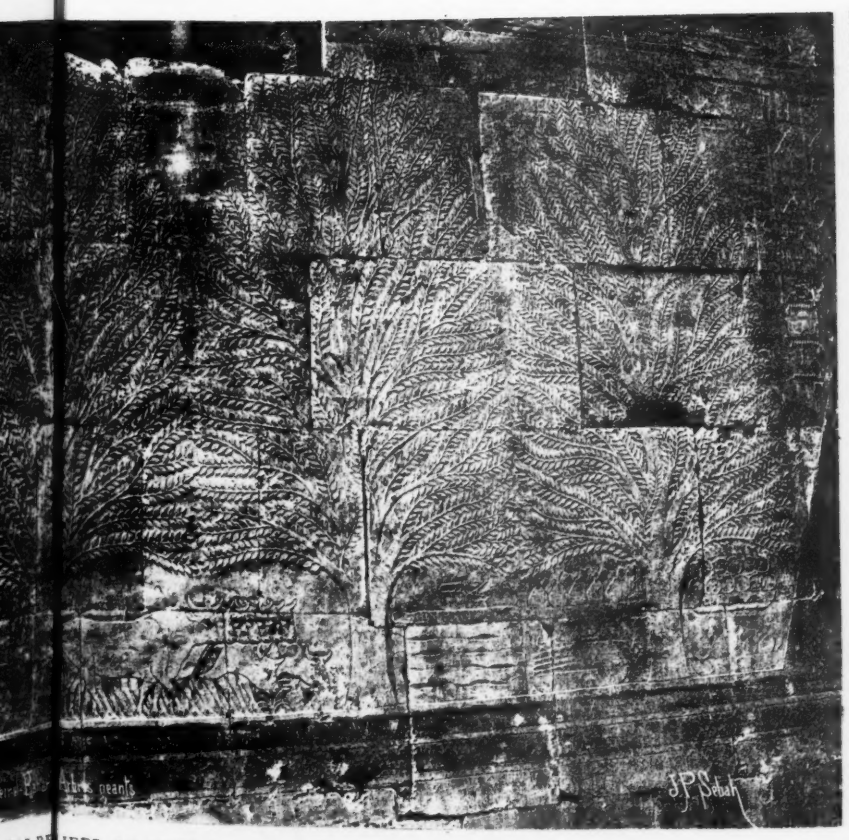
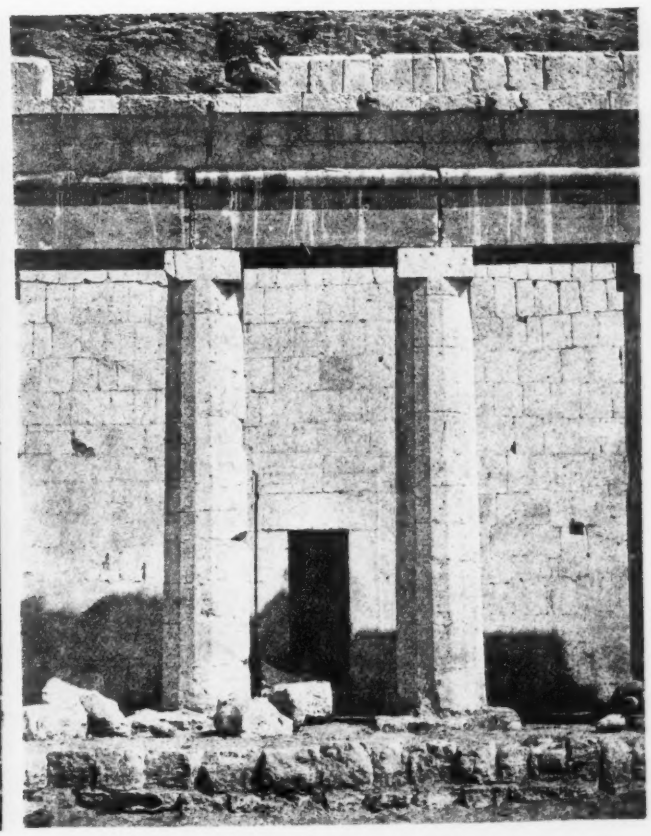


PLAN OF THE TEMPLE.



BAS-RELIEFS OF TREES: SOUTHERN HALF OF MIDDLE COLONNADE.



PART OF NORTH COLONNADE.

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EWBERRY'S PAPER AT THE ARCHITECTURAL ASSOCIATION.
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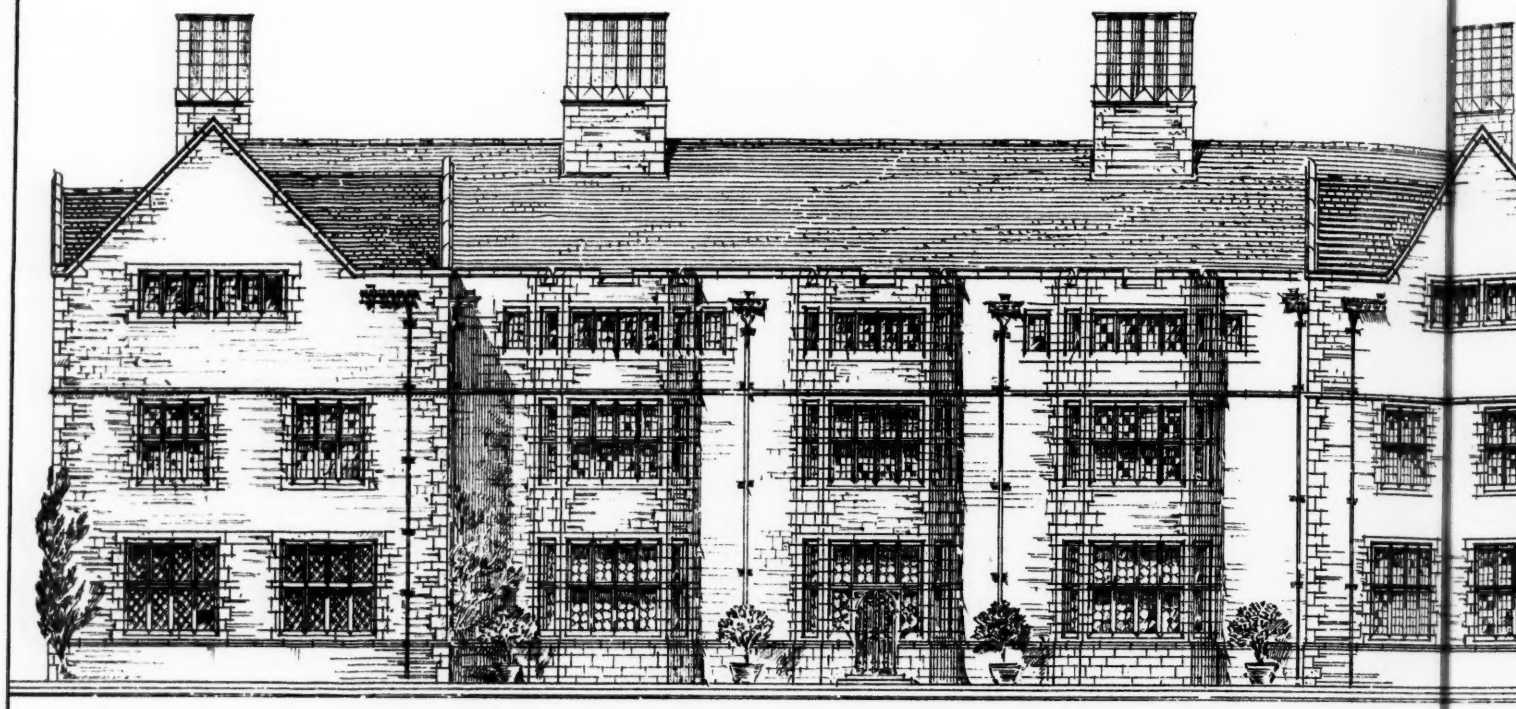

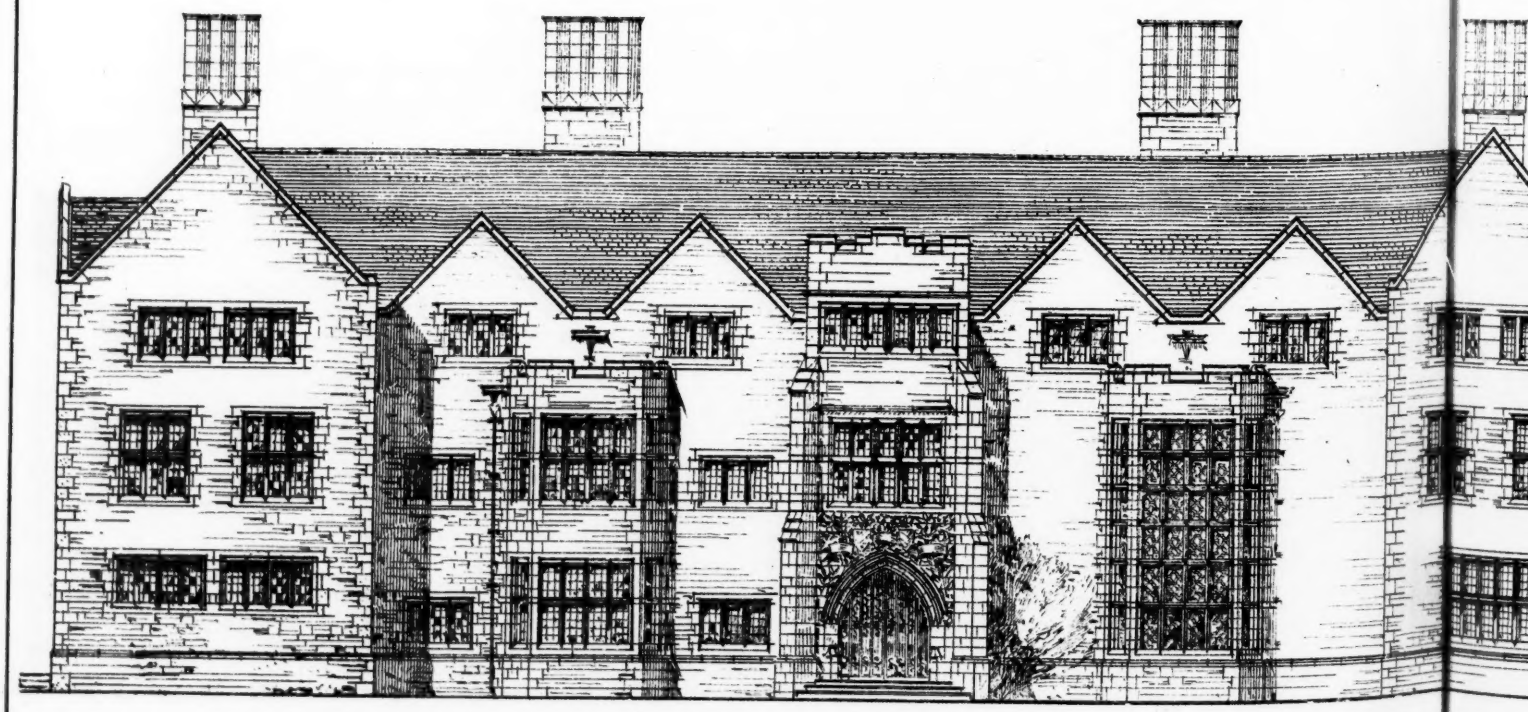

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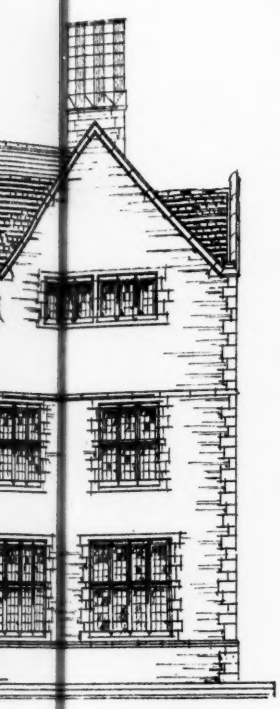
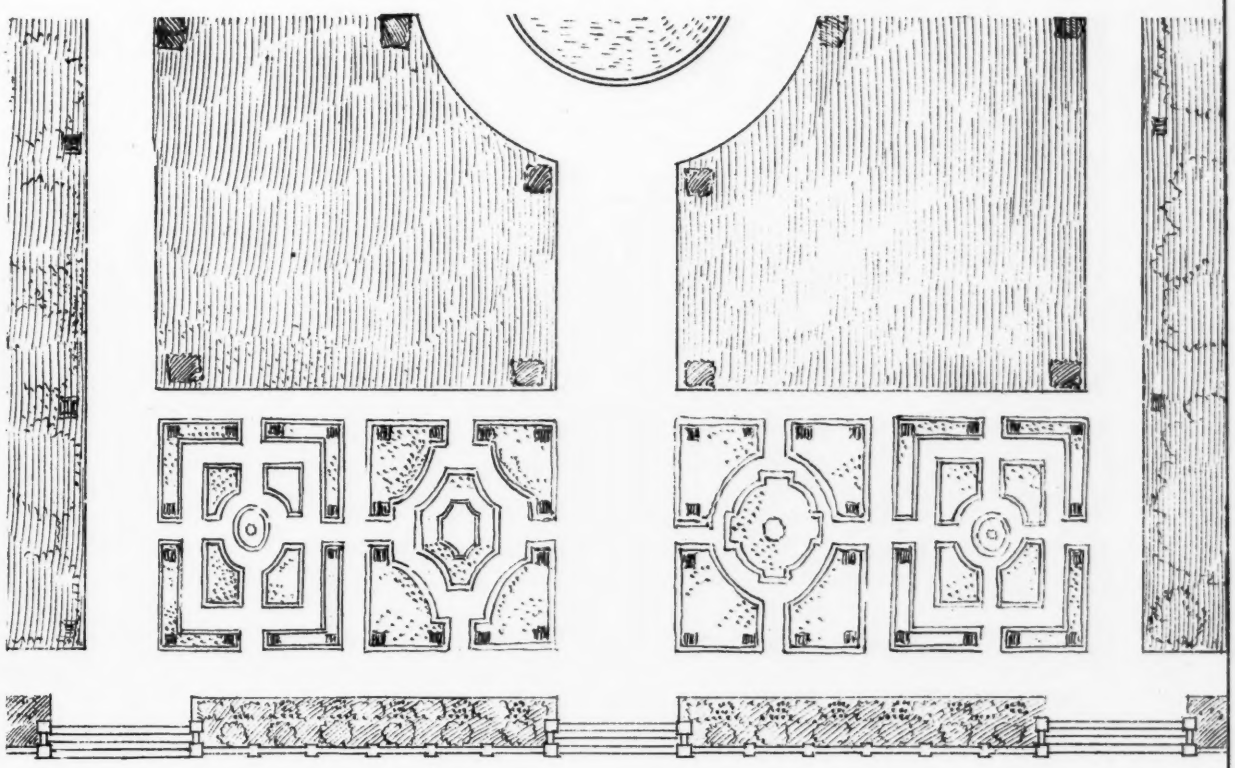
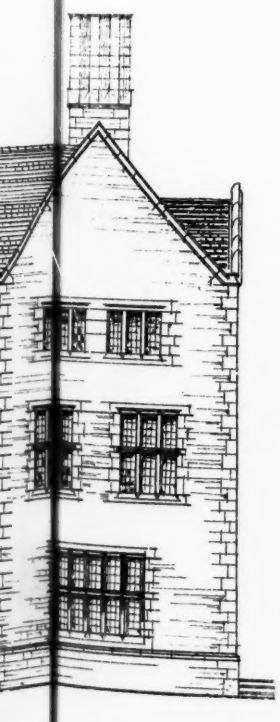
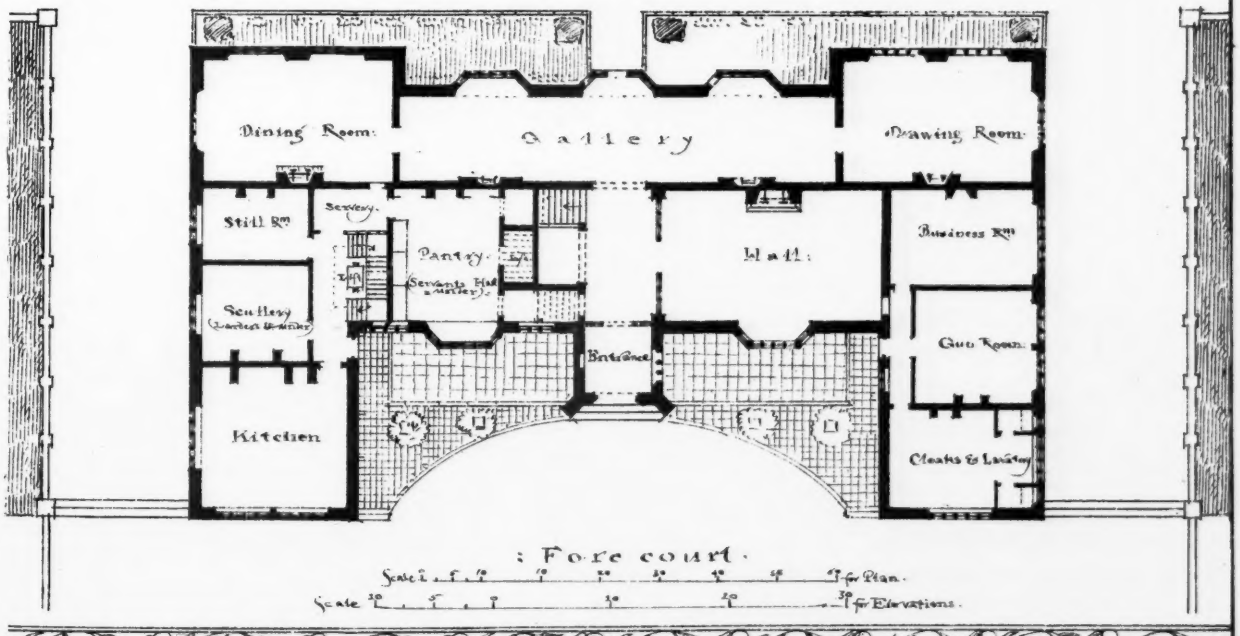




Terrace





: Fore court :

Scale 1 . 2 . 3 . 4 . 5 . 6 . 7 . 8 for Plan.

Scale 20 . 5 . 0 . 10 . 20 . 30 for Elevations.

DESIGN · FOR · A · COUNTRY · HOUSE :

Entrance & Garden Elevations: & Plan:

Gerald: C: Horsley: Architect

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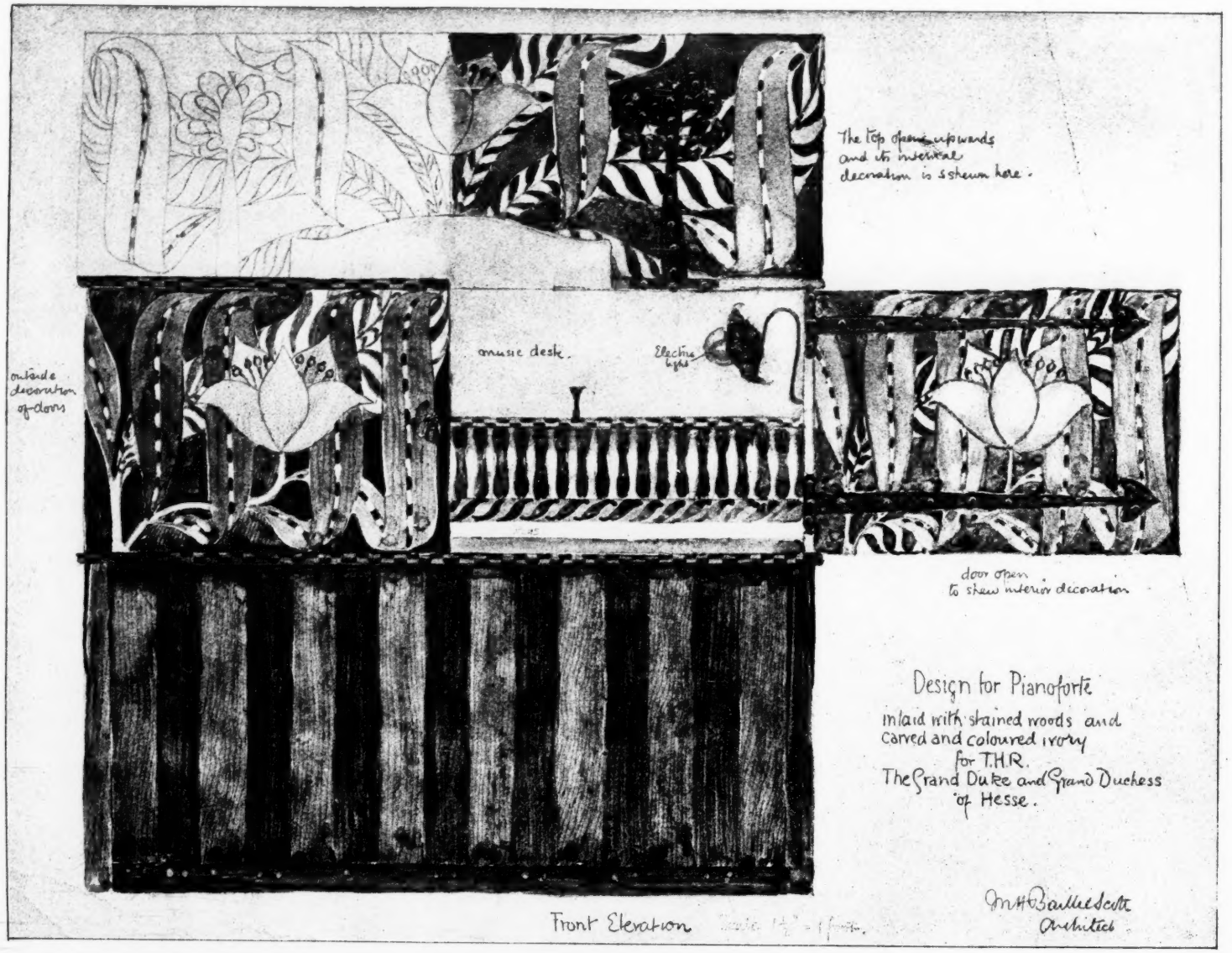
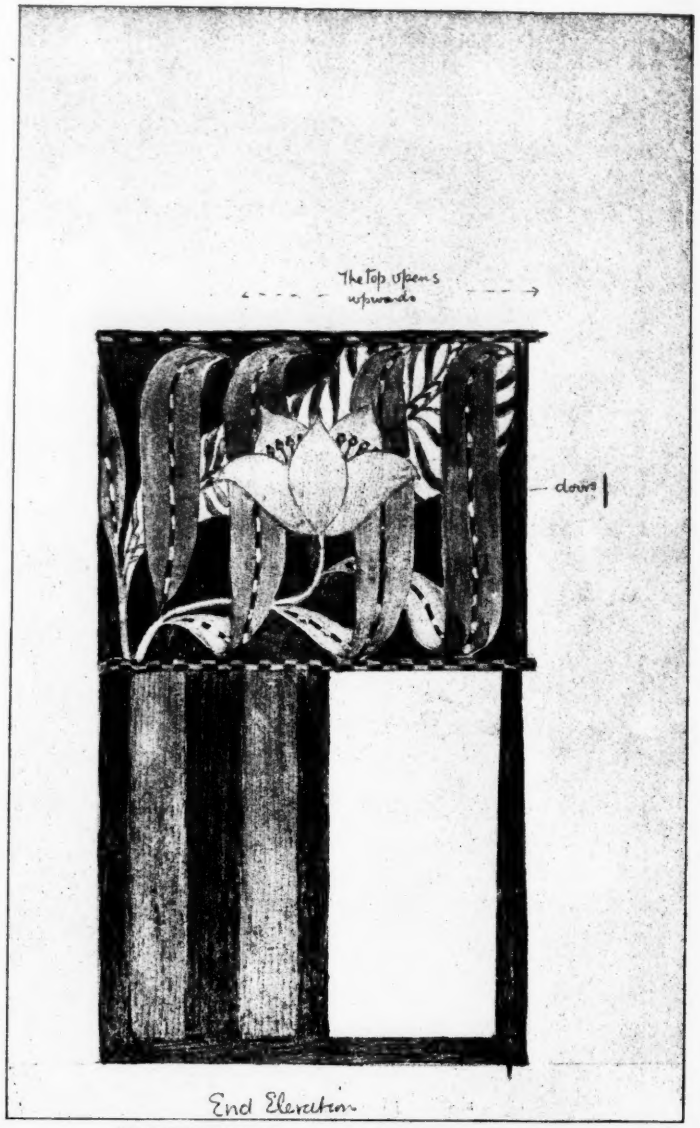

The top opens upwards and its internal decoration is shewn here.
music desk.
Electric lights
outside decoration of doors
door open to shew interior decoration

Design for Pianoforte
inlaid with stained woods and carved and coloured ivory
for T.H.R.
The Grand Duke and Grand Duchess of Hesse.

M. H. Baillie Scott
Architect

Front Elevation Scale 1½" = 1 ft.



End Elevation

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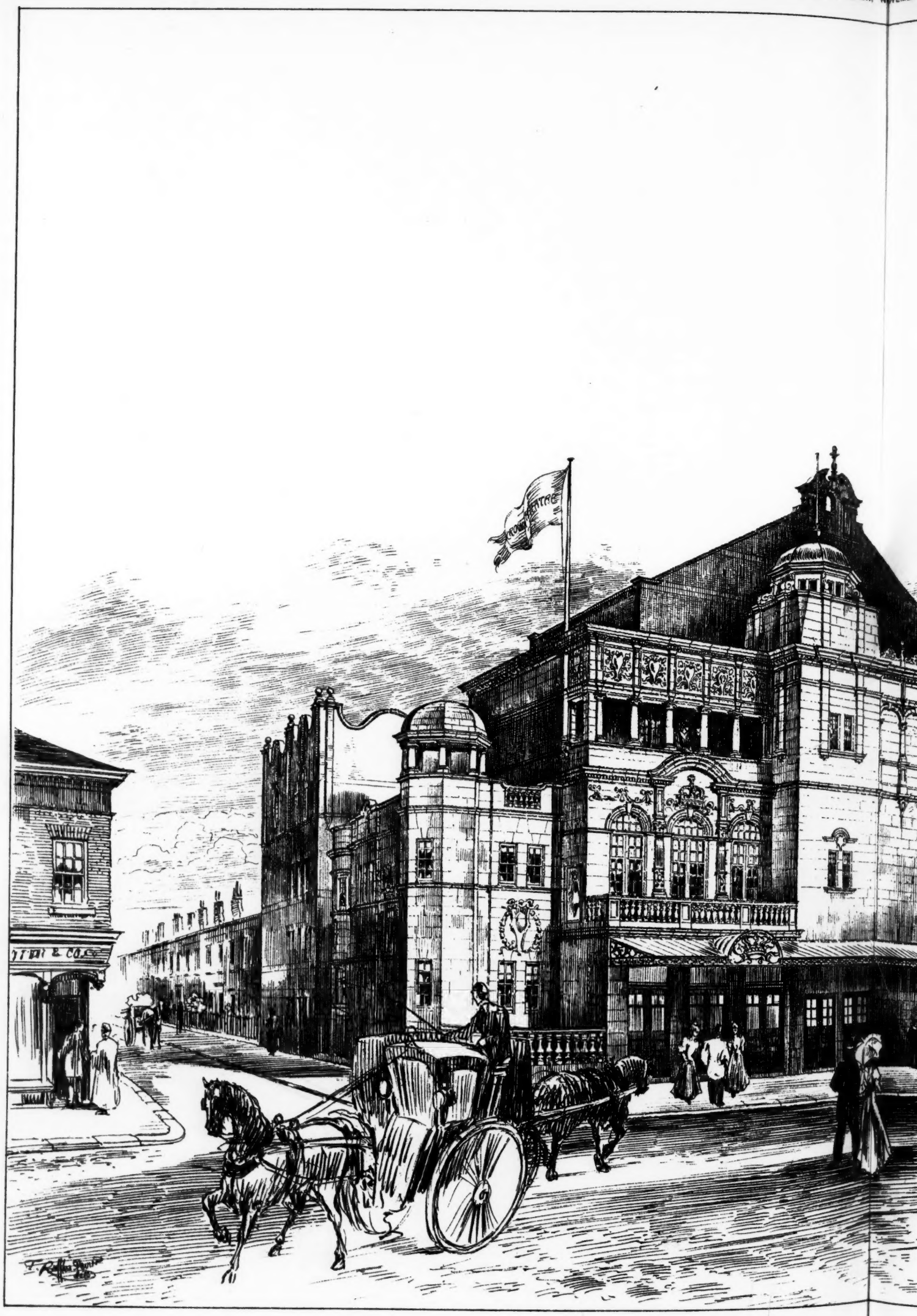
DESIGN FOR STAINED GLASS.—By Mr. Leonard Walker.



THE CROWN THEATRE, PECKHAM.—MR

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E, PECKHAM.—Mr. Ernest Runtz, Architect.